# GLOBAL EXPLOSIVE ORDNANCE DISPOSAL CONFERENCE AND EXHIBITION

*"Combating Terrorist Use of Explosives"*

April 27 - 30, 2010
Fort Walton Beach, FL

Agenda

**Wednesday, April 27, 2010**

**Welcome Remarks**
- Mr. Jim O'Neil, Deputy Vice Chairman, NDIA EOD Planning Committee; Executive Director, EOD Memorial Foundation

**Keynote Remarks** – *The Three Dimensional EOD Warrior – Defense, Diplomacy and Development*
- Colonel Leo Bradley, USA, Chief EOD & HMA, Office of the Assistant Secretary of Defense for Special Operations Low Intensity Conflict & Interdependent Capabilities

**NATO EOD Working Group Update**
- Wing Commander James P. Brudenell, Air Force of the United Kingdom Explosive Ordnance Disposal Working Group, North Atlantic Treaty Organization (NATO)

**Science and Technology for Countering Improvised Explosive Devices**
- Dr. Ruth Doherty, Program Executive Officer for Counter IED, U.S. Department of Homeland Security

**Irregular Warfare**
- Mr. David Johnson, Executive Director, Center for Advanced Defense Studies

**Interagency Combating Terrorism Technology Support**
- Mr. Gabriel Ramos, Deputy Director for Technology, Department of Defense Combating Terrorism Technical Support Office, Office of the Secretary of Defense

**Interagency Improvised Explosive Device Defeat**
- Dr. Edwin A. Bundy, Program Manager, EOD/Low-Intensity Conflict, Department of Defense Combating Terrorism Technical Support Office, Office of the Secretary of Defense

**Thursday, April 29, 2010**

**Keynote Remarks –** *Building Collaborations in Countering IEDs*
- Mr. Jim W. Blackburn, Assistant Capability Manager Engagement, European Defense Agency

**Defense Threat Reduction Agency Support of the EOD Force**
- Mr. Michael Barry, Explosive Ordnance Specialist, DTRA Combating Terrorism Division

**SERVICES STATE OF THE UNION ON EOD**
- **Navy -** Commander Eugene Rathgeber, USN, EODGRUONE, Navy Expeditionary Combat Command
- **Marine Corps** - Lieutenant Colonel Marc Tarter, USMC, EOD Action Officer/Occ Sponsor, Office of the Director, Logistics Plans, Policies and Strategic Mobility, Headquarters, U.S. Marine Corps
- **Air Force** - Lieutenant Colonel Laurie Richter, USAF, EOD Program Director, Headquarters, U.S. Air Force A4/7

**EOD Training Panel**
- Lieutenant Colonel Jeffrey LaCaze, USA, Director, U.S. Army EOD Land Warfare Center of Excellence

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## Friday, April 30, 2010

**Coalition Joint Task Force Troy (Iraq) Efforts to Defeat Explosive Ordnance and Improvised Explosive Devices**
- Colonel Patrick J. Kelly, USA, Commander, 71st Ordnance Group EOD

**Ground Forces Panel**
- Colonel Thomas J. Langowski, USA, 52d OD GP EOD

**Explosive Ordnance Disposal Directorate Brief**
- SGM Frey

# NDIA
National Defense Industrial Association

# GLOBAL EXPLOSIVE ORDNANCE DISPOSAL
## Conference and Exhibition

*"Combating Terrorist Use of Explosives"*

WWW.NDIA.ORG/MEETINGS/0950
APRIL 27 - 30, 2010
EVENT #0950

**NDIA and The EOD Memorial Foundation present the Global Explosive Ordnance Disposal Conference and Exhibition**

The EOD Memorial
FOUNDATION

## LOCATION

Emerald Coast Conference Center
1250 Miracle Strip Parkway SE
Fort Walton Beach, FL 32548

## ATTIRE

Appropriate dress for the conference is business coat & tie for civilians and Class A uniform or uniform of the day for military personnel.

## ID BADGES

During conference registration and check-in, each attendee will be issued an identification badge. Please be prepared to present a valid picture ID. Badges must be worn at all conference functions.

## PROCEEDINGS

Conference proceedings will be available online approximately two weeks after the event. You will receive an e-mail notification once the proceedings are available for viewing.

## SPEAKER DONATION

In lieu of Speaker gifts, a donation has been made to the EOD Memorial Foundation.

## CONTACTS

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# Global Explosive Ordnance Disposal Conference and Exhibition

April 27 - 30, 2010
Emerald Coast Conference Center, Fort Walton Beach, Florida

## *"Combating Terrorist Use of Explosives"*

## Tuesday, April 27

| | |
|---|---|
| 12:00 – 6:30 PM | **Conference Registration** |
| 5:00 – 6:30 PM | **Opening Reception in Exhibit Hall** |

## Wednesday, April 28

| | |
|---|---|
| 7:00 – 8:00 AM | **Continental Breakfast in Exhibit Hall** |
| 7:00 – 6:30 PM | **Conference Registration** |
| 8:00 – 8:30 AM | **Welcome Remarks**<br>Mr. Eugene Squires, Chairman, NDIA EOD Planning Committee; Senior Partner, Squires & Fulcher, LLC Management Consultants<br><br>Mr. Jim O'Neil, Deputy Vice Chairman, NDIA EOD Planning Committee; Executive Director, EOD Memorial Foundation |
| 8:30 – 9:15 AM | **Keynote Remarks – The Three Dimensional EOD Warrior – Defense, Diplomacy and Development**<br>Colonel Leo Bradley, USA, Chief EOD & HMA, Office of the Assistant Secretary of Defense for Special Operations Low Intensity Conflict & Interdependent Capabilities |
| 9:15 – 10:00 AM | **NATO EOD Working Group Update**<br>Wing Commander James P. Brudenell, Air Force of the United KingdomExplosive Ordnance Disposal Working Group, North Atlantic Treaty Organization (NATO) |
| 10:00 – 10:30 AM | **Networking Break in Exhibit Hall** |
| 10:30 – 11:15 AM | **So Who is the "Pointy End of The Spear" Today?**<br>Mr. Gary Motsek, Assistant Deputy Under Secretary of Defense (Program Support), Office of the Under Secretary of Defense (Acquisition, Technology and Logistics) |

11:15 – 12:00 PM **Science and Technology for Countering Improvised Explosive Devices**
Dr. Ruth Doherty, Program Executive Officer for Counter IED, U.S. Department of Homeland Security

12:00 – 1:30 PM **Networking Lunch in Exhibit Hall**

1:30 – 2:15 PM **Improvised Explosive Devices – Strategic Weapons of Influence for Irregular Warfare**
Colonel Karl Reinhard, USA, Executive Officer to the Director, Joint Improvised Explosive Device Defeat Organization

2:15 – 3:00 PM **Irregular Warfare**
Mr. David Johnson, Executive Director, Center for Advanced Defense Studies

3:00 – 3:30 PM **Networking Break in Exhibit Hall**

3:30 – 4:00 PM **Interagency Combating Terrorism Technology Support**
Mr. Gabriel Ramos, Deputy Director for Technology, Department of Defense Combating Terrorism Technical Support Office, Office of the Secretary of Defense

4:00 – 4:30 PM **Interagency Improvised Explosive Device Defeat**
Dr. Edwin A. Bundy, Program Manager, EOD/Low-Intensity Conflict, Department of Defense Combating Terrorism Technical Support Office, Office of the Secretary of Defense

4:30 – 5:00 PM **Interagency Irregular Warfare Support**
Mr. Richard Higgins, Program Manager, Irregular Warfare Support, Department of Defense Combating Terrorism Technical Support Office, Office of the Secretary of Defense

5:00 – 6:30 PM **Reception in Exhibit Hall**

## Thursday, April 29

7:00 – 8:00 AM **Continental Breakfast in Exhibit Hall**

7:00 – 5:00 PM **Conference Registration**

8:00 – 8:15 AM **Welcome Remarks**
Lieutenant General Donald Wetekam, USAF (Ret), Group Vice President, Maintenance, Repair and Overhaul, AAR Corporation

8:15 – 9:00 AM **Keynote Remarks – Building Collaborations in Countering IEDs**
Mr. Jim W. Blackburn, Assistant Capability Manager Engagement, European Defense Agency

9:00 – 9:45 AM **EOD's Vital Role in Protecting the Force**
Rear Admiral Archer M. Macy, Jr., USN, Director, Joint Integrated Air & Missile Defense Organization, Deputy Director for Force Protection, J-8, The Joint Staff

9:45 – 10:15 AM **Networking Break in Exhibit Hall**

10:15 – 11:00 AM **Defense Threat Reduction Agency Support of the EOD Force**
Mr. Michael Barry, Explosive Ordnance Specialist, DTRA Combating Terrorism Division

| | |
|---|---|
| 11:00 – 3:00 PM | **SERVICES STATE OF THE UNION ON EOD** |
| 11:00 – 11:45 AM | **Army**<br>Brigadier General Ernest C. Audino, USA, Director, G-33 Current Operations, HQDA ODCS G-3/5/7 |
| 11:45 – 12:30 PM | **Navy**<br>Commander Eugene Rathgeber, USN, EODGRUONE, Navy Expeditionary Combat Command |
| 12:30 – 1:30 PM | **Networking Lunch in Exhibit Hall** |
| 1:30 – 2:15 PM | **Marine Corps**<br>Lieutenant Colonel Marc Tarter, USMC, EOD Action Officer/Occ Sponsor, Office of the Director, Logistics Plans, Policies and Strategic Mobility, Headquarters, U.S. Marine Corps |
| 2:15 – 3:00 PM | **Air Force**<br>Lieutenant Colonel Laurie Richter, USAF, EOD Program Director, Headquarters, U.S. Air Force A4/7 |
| 3:00 – 3:30 PM | **Networking Break in Exhibit Hall**<br>**(Last Chance to View Exhibits)** |

## SIMULTANEOUS BREAKOUT PANELS

| | |
|---|---|
| 3:30 – 5:00 PM | **BREAKOUT PANEL (LOCATION: GENERAL SESSION ROOM)**<br>**Joint and Coalition Operations Panel**<br>**Moderator** – Colonel Leo Bradley, USA, Chief EOD & HMA, Office of the Secretary of Defense for Special Operations Low Intensity Conflict & Interdependent Capabilities<br>- Warrant Officer Quentin Paske, Air Force of Australia<br>- Warrant Officer Class 2 Matt Tanner, Army of Australia<br> Wing Commander James Brudenell, Air Force of United Kingdom<br>- Lieutenant Colonel Leland Browning, USA, US Head of Delegation for NATO EOD |
| 3:30 – 4:15 PM | **BREAKOUT PANEL (LOCATION: ISLAND ROOM)**<br>**EOD Training Panel**<br>Lieutenant Colonel Jeffrey LaCaze, USA,  Director, U.S. Army EOD Land Warfare Center of Excellence |
| 4:15 – 5:00 PM | **BREAKOUT PANEL (LOCATION: ISLAND ROOM)**<br>**EOD Technology Panel**<br>Major D. Landon Phillips, USAF, Chairman, EOD Military Technical Acceptance Board Officer in Charge, USAF Detachment 63, NAVEODTECHDIV |
| 5:00 PM | **Adjourn for the Day** |

# Friday, April 30

**7:00 – 8:00 AM**   **Continental Breakfast in Foyer**

**7:00 – 12:00 PM**   **Conference Registration**

**8:00 – 8:15 AM**   **Welcome Remarks**
Mr. Jim O'Neil, Deputy Vice Chairman, NDIA EOD Planning Committee; Executive Director, EOD Memorial Foundation

**8:15 – 9:00 AM**   **Keynote Remarks – Coalition Joint Task Force Paladin (Afghanistan) Efforts to Defeat Explosive Ordnance and Improvised Explosive Devices**
Command Sergeant Major Randall Hefner, USA, CSM, CJTF-Paladin

**9:00 – 9:30 AM**   **Coalition Joint Task Force Troy (Iraq) Efforts to Defeat Explosive Ordnance and Improvised Explosive Devices**
Colonel Patrick J. Kelly, USA, Commander, 71st Ordnance Group EOD

**9:30 – 10:00 AM**   **Networking Break in Foyer**

## SIMULTANEOUS BREAKOUT PANELS

**10:00 – 12:00 PM**   **GROUND FORCES PANEL (LOCATION: GENERAL SESSION ROOM)**

**Moderator** – Major General Walt Davis, USA, Deputy Director, Army Capabilities Integration Center, Training & Doctrine Command
- Colonel Thomas J. Langowski, USA, 52d OD GP EOD
- Colonel Patrick J. Kelly, USA, 71st OD GP EOD
- Lieutenant Colonel Walt Romine, USMC, Marine Forces Command: EOD Officer
- Master Gunnery Sergeant, Michael Todd, USMC, HQMC, EOD MOS Manager
- Command Sergeant Major Randall Hefner, USA, CSM, CJTF-Paladin

**10:00 – 12:00 PM**   **NAVAL AND AIR FORCE  PANEL (LOCATION: SUNSET ROOM)**

**Naval Forces**
**Moderator** – Mr. Ken Falke, Chairman, A-T Solutions, Inc.
- Commodore Theodore Lucas, USN, EODGRU ONE
- Commodore Dale G. Fleck, USN, EODGRU TWO

**Air Forces**
**Moderator** – Mr. Dan Tompkins, Safety Officer, ECC
- Lieutenant Colonel Tim Bongiovi, USAF, Commander, 23 CES/CC
- Major Joshua Tyler, USAF, NAF CE Officer
- Chief Master Sergeant (Select) James Brewster, USAF, 4 CES Flight Superintendent
- Chief Master Sergeant Robert Hodges, USAF, EOD Career Field Manager
- Chief Master Sergeant Jerry Shelton, USAF, AFCENT EOD Functional Manager

**12:00 PM**   **Conference Adjourns**

# *DTRA's Support to the Explosive Ordnance Disposal (EOD) Community*

*29 April 2010*
*Emerald Coast Conference Center*
*Fort Walton Beach, FL*



# *Making the world safer*

# Agenda

- What and who is DTRA?
  - Cooperative Threat Reduction (CTR)
  - Small Arms & Light Weapons (SALW)
- Improvised Explosive Devices (IEDs)
- IED Attack and Defeat Cycles
- The IED Threat: Persistent and Evolving
- Commonalities & Differences between High Explosive (HE) and Chemical, Biological, Radiological, and Nuclear (CBRN) type devices
- How DTRA Become Involved with IEDs
- DTRA Support to the EOD Community
- DTRA's Ongoing IED related R&D technology projects

# Defense Threat Reduction Agency

## DTRA

The Defense Threat Reduction Agency (DTRA) is a combat support agency of the U.S. Department of Defense (DoD). Founded in 1998, the agency headquarters is located in Fort Belvoir, Virginia.  DTRA employs 2,000 men and women, both military and civilian, at more than 14 locations around the world.

## DTRA's Mission

To safeguard the United States and its allies from weapons of mass destruction (WMD) (chemical, biological, radiological, nuclear and high-yield explosives (CBRNE)) by providing capabilities to reduce, eliminate, and counter the threat and mitigate its effects.

# Cooperative Threat Reduction (CTR)

CTR's non-proliferation effort reaches across the European, Central, and Pacific Commands' AORs – and may possibly expand to other Commands – to eliminate, secure and interdict nuclear, chemical and biological materials that could be used against the United States, its partners, allies, and friends.



OSD Policy establishes guidance and coordinates necessary agreements for all CTR activities.

DTRA is the implementing agent; responsible for all aspects of program, contract, and funding management.

# CTR Program Areas

- Strategic Offensive Arms Elimination

- Nuclear Weapons Safety & Security

- Biological Threat Reduction Program

- WMD Proliferation Prevention

- Chemical Weapons Elimination

# Small Arms & Light Weapons

- Small arms: weapons designed for personal use:
  - Revolvers, rifles, sub-machine guns, assault rifles, LMGs
- Light weapons: designated for use by several persons serving as a crew:
  - Mortars (< 100mm), crew served MGs, Man-Portable Air Defense Systems (MANPADS), recoilless rifles, crew-served grenade launchers, man-portable rocket/missile systems/anti-tank guns
- Ammunition and Explosives:
  - Small Arms Ammunition for small arms), shells and missiles for light weapons, all grenades, landmines, explosives

# What is an IED?

- IED: An explosive device used in an unconventional manner by terrorist, guerrilla, criminal, or commando forces
  - Design: from crude to very sophisticated
  - CAN include explosive material OR chemical, biological or radiological payloads
  - Only limited by the imagination of the builder
    - Size, shape, container, lethality, initiators/triggers



**Radio Controlled IED**

**Suicide Bomber Vest**

**Improvised Rocket Launcher**

**Vehicle IED  VBIED**

# IED Components

- **Components**
  - **Container**
  - **Power source**
  - **Switch**
  - **Initiator**
  - **Main charge**

**Power source** **Initiator** **Main charge**



**Container**

**Switch**
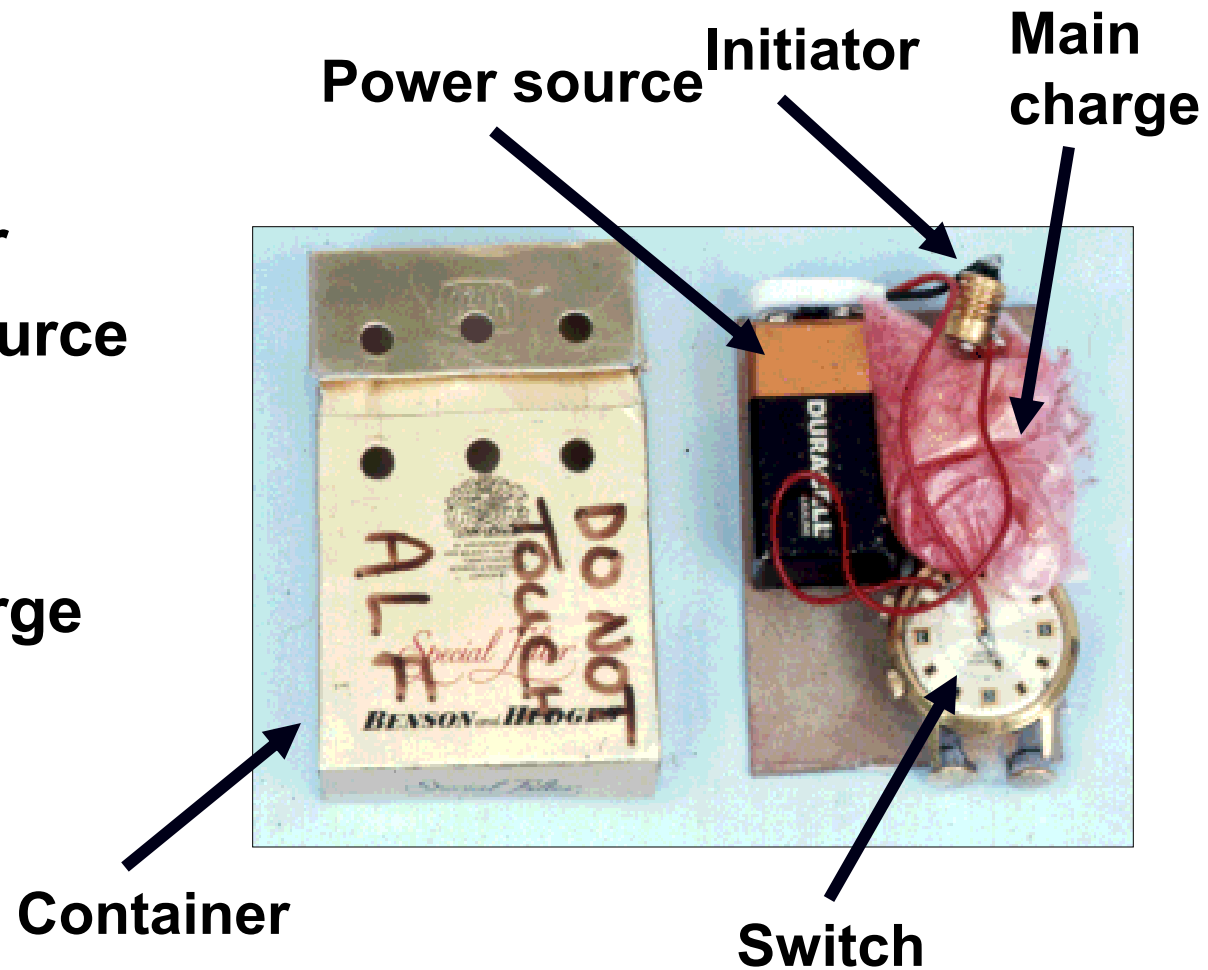
# IEDs – A Persistent Threat

- **For a few years, the single largest cause of U.S./Coalition casualties**

- **Use by Jihadists has steadily increased over the last 7 years**
  - **Used in a large number of attacks on coalition forces**
  - **Specifically targeting critical forces:**
    - **First Responders**
    - **EOD**

- **The breadth of use has expanded since their first appearance in Iraq in 2003**

# IEDs – An Evolving Threat

- Explosives are readily available to terrorists, including advanced explosive charges
- Advanced sensor and remote detonation technologies
- There are multiple arming and firing systems

# Commonalties & Differences

**IEDs**

**WMD Dispersal Devices**

| Safe Separation | ⟷ | Safe Separation |
| Arming | ⟷ | Arming |
| Firing | ⟷ | Firing |
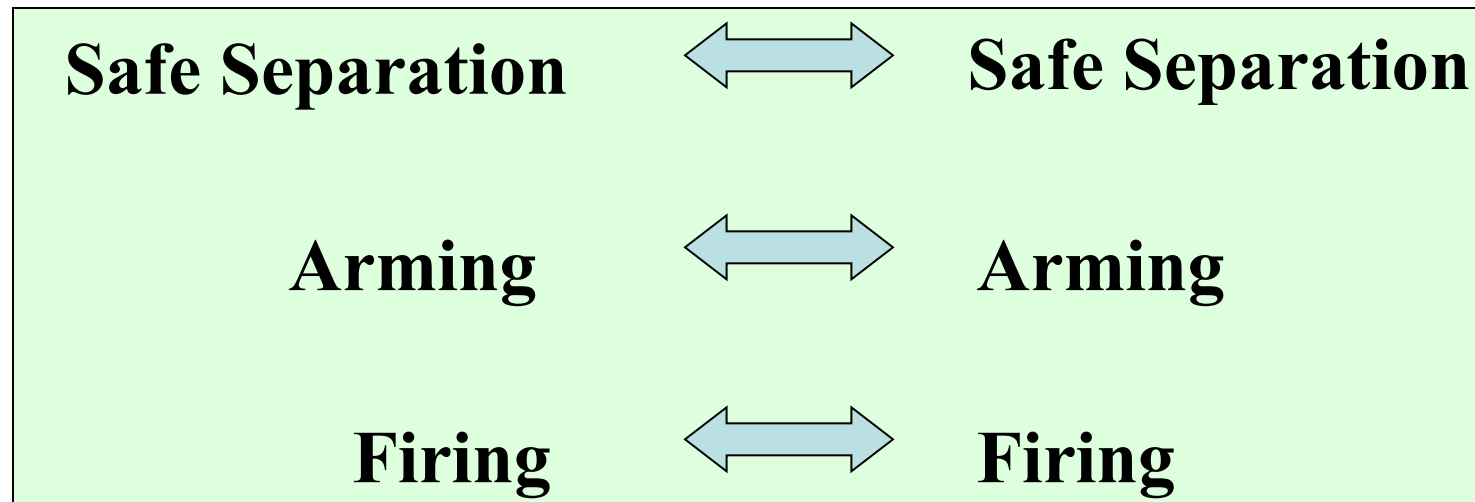
**High Explosives**  **?**  **CBRN**

- Render Safe Procedures
- Can Often Blow-in-Place
- Current TTPs

- Can NEVER BIP
- Modified TTPs
- MUST Render Safe

# How DTRA Became Involved in IEDs

- Commands requested DTRA assistance
- DTRA Liaison Officer deployed to OIF
- Delivered first equipment shipment
- Delivered additional shipments
- Maintained Liaison Officer presence in theater
- Currently supporting Allied forces on WMD matters

# Phase I – COTS Solution

- Provided modified Commercial Off The Shelf (COTS) technologies directly to deployed OEF/OIF forces
- Delivered new EOD support tools into theater (over 2700 items)
- Proved concept for X-ray backscatter interrogation
- Proved concept for disposable robot
- Hosted 1st International IED Workshop

# Phase I - Tactical Optics Solutions

- Thermal Imagers
- Video Cameras
- Range Finders
- Stabilized Binoculars
- Wireless Camera Systems
- Spotting Scopes

# Phase I - Other Solutions



Disposable Robot



Segway

# Phase II - Rapid Development and Tng

- Material Solutions

  - Portable Forensics Kit

  - Non-Intrusive Detection

  - Vehicle Borne IED Defeat System

- Mobile Training Teams (MTTs) to train the trainer

# Phase II - Mobile Training Teams (MTT)

- Provided familiarization training related to DTRA sponsored equipment

- Provided to deploying EOD Forces with DTRA sponsored equipment

- Assisted in developing IED training scenarios

- Enabled development of tactics, techniques and procedures (TTPs)

- Enabled the development and validation of new concepts of operations

# Phase III – Prepare for the Future

- Investigate, introduce and implement long-term technology development to counter the IED threat

- Support the warfighter

- Prepare for the possibility of the WMD IED

# Phase III – Other Technologies

## Vessel Boarding & Inspection System

Broadband wireless connectivity, two way communications, streaming video and WMD sensor data from host ship through inspection of boarded vessel of interest

## Deployable Technical Intelligence Laboratory

State-of-the-art, immediately deployable, self-contained forensics laboratory for combat operations, contingency missions, and training

## Multi-Nodal Unattended Ground Sensor
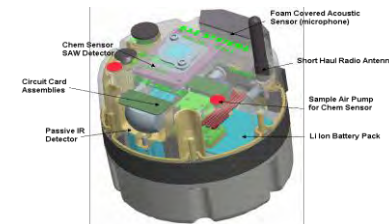
Hand emplaced multi-modal (acoustic, seismic, PIR and chemical (CWA and TICS) ) sensing wireless nodes for situational awareness and intrusion detection

## Prototype Passive Millimeter Wave Imaging System

Suicide bomber detection
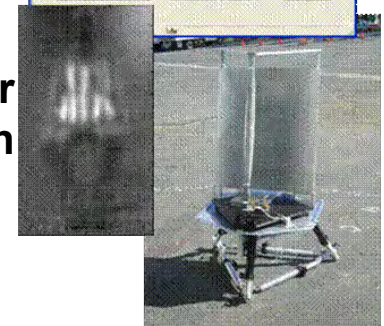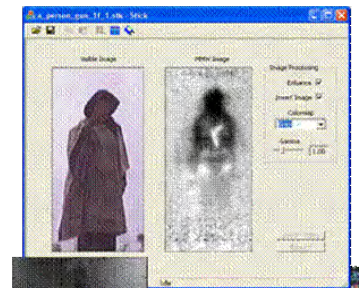
# Phase III – Other Technologies

- Engineered Neutralization and Dispersion Source (ENDS) - creates a synergistic blast/fragment load environment that is severe enough to dismember and neutralize the IED without precipitating high-order detonation

- Developed a system to detect and identify concealed radioactive emissions in extreme environments

- Developed an enzyme method for detecting the presence of blood, nerve, and blister agents

- Working on a low-cost system for rapid screening of suspect areas with near real-time identification of explosives

# What Does This All Mean?

It means that with the continued emphasis on combating WMD and securing the homeland, the Defense Threat Reduction Agency will play an increasingly important role in the ability locate, access, diagnose and defeat improvised explosive devices.

# Fielded Efforts

- DTRA has expended significant resources to put tools into the hand of the operator. The following slides depict some of these efforts
    - Detection Tools
    - Diagnostic Tools
    - Access Tools
    - Defeat tools

# Detection Tool - XPAK

- Trace Explosives Detector
- Real time
- Built in GPS
- Detects Commercial Explosives
- Future Development
  - Smaller
  - Lighter
  - Detect HME

# Device Information systems

- HME Data base – everything you wanted to know about home made explosives

- CB Data base- all inclusive chemical and biological searchable data base

- Data Extraction Tool- Works with Triage system to help characterize device design and rapidly identify potential Improvised Nuclear Devices

# Diagnostic Tool – Ltwt X-Ray Generator

- May replace XR150

- Improved lightweight X-ray sy

  - Lighter

  - More reliable

  - Higher energy

- Currently in development at LANL

# Diagnostic Tool – Scanner

- Lightweight Phosphor panel digital scanner

- 7 pounds

- Battery powered

- Back packable
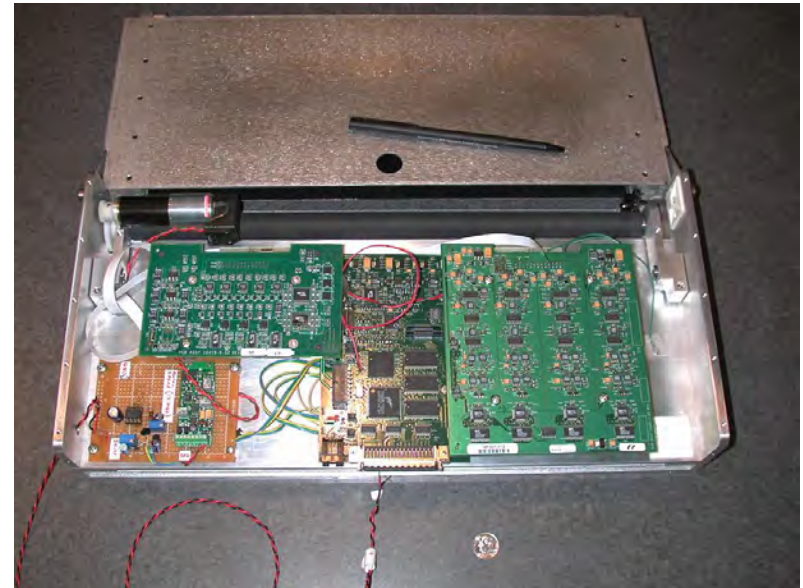
# Diagnostic Tool – Digital Probe



- Improved performance

- Modular probe extensions

- Increased sensitivity across dynamic range

- Passive Diagnostic tool

# Diagnostic Tool – Torion GCMS

- **Gas Chromatograph Mass Spectrometer**

  - Near Real Time <1AMU resolution
  - System is totally self-contained
  - Weighs less than 28 pounds
  - Battery or fixed power operated
  - Easy to operate with a simple three button navigation
  - Ideal for rapid screening of chemicals including VOCs/SVOCs
  - Explosives, chemical warfare agents, and hazardous substances

# Diagnostic Tool – Metal Detector

- Smaller and lighter
- Folding and telescoping design
- Active/passive and merged modes
- 5lbs or less



Embedded GPR head

Pistol grip with attached display

Collapsing arm support

Removable battery compartment

Collapsed System
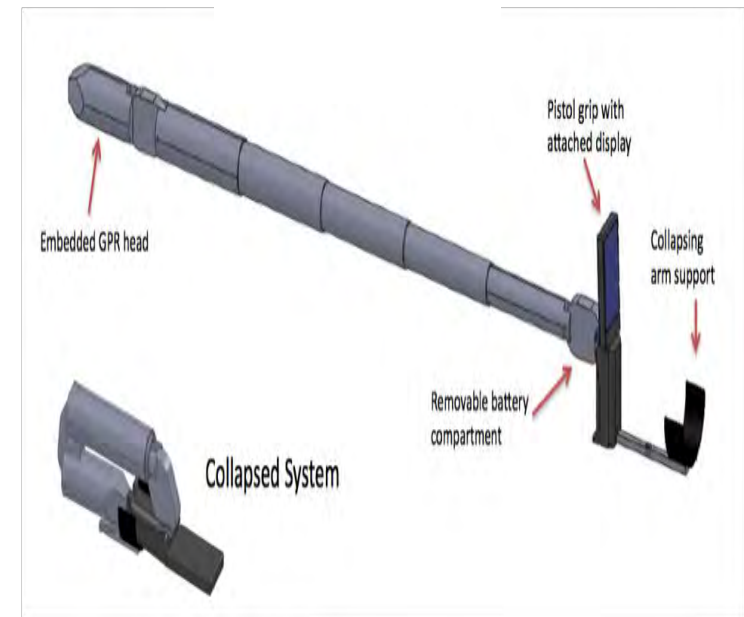
# Access Tool – Conex Cutter

- Lightweight

- High mechanical advantage

- Cuts a 2' X 2' square access panel in 1/8" conex skin in under 2 minutes

# Access Tool – Smart Knife

- Battery powered
- Quick recharge
- Almost instant on
- Multiple blades for various type cuts
- Rapid temperature adjustment
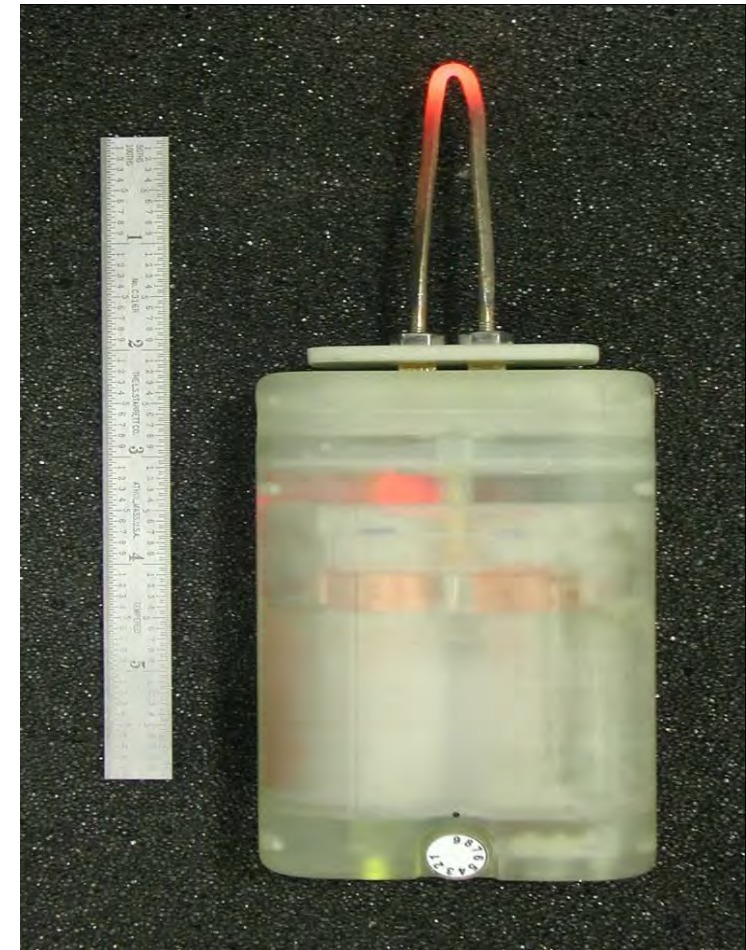
# Mechanical Tools – Coaxial Cutter

- Light weight
- Expandable in length
- Multiple heads for different applications
- Used on smaller coax

# Mechanical Tools– Medium Coaxial Cutter

- Light weight

- Expandable

- Multiple heads for various applications

- For medium size coax

# Mechanical Tools– Heavy Coaxial Cutter

- Light weight
- Expandable
- Multiple heads for various applications
- For large heavy duty coax

# Mechanical Tools – Coaxial Cutter Shaft

- Flexible shaft for use with a variety of co axial cutters

- Expandable to give greater flex

# Mechanical Tools – Shorting Tool

- Insulated Shorting Tool Head

- Allows precise placement of shunting pins
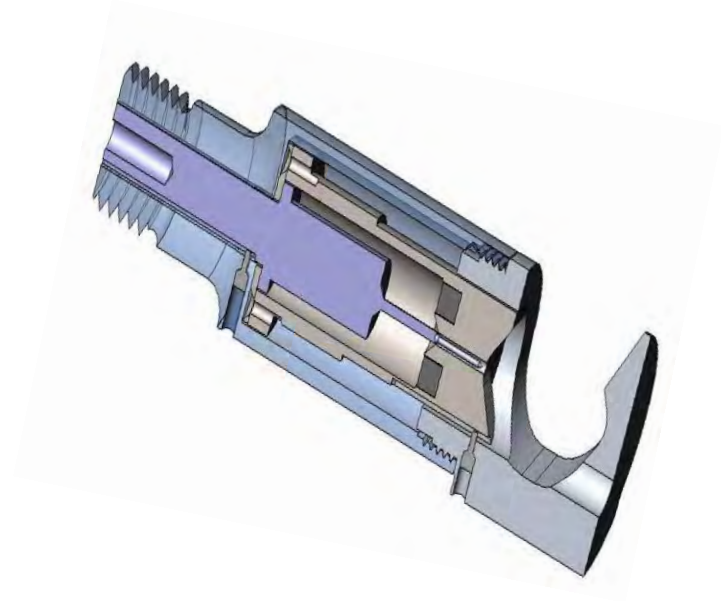
# Defeat Tool – Precision Aim Suite

- Single integrated system

- Constructs 3d view of target

- Allows exceptional accuracy with a variety of disruption charges

# Defeat Tool – Shaped Charges

- Various types of shaped charges

# Testing and Evaluation
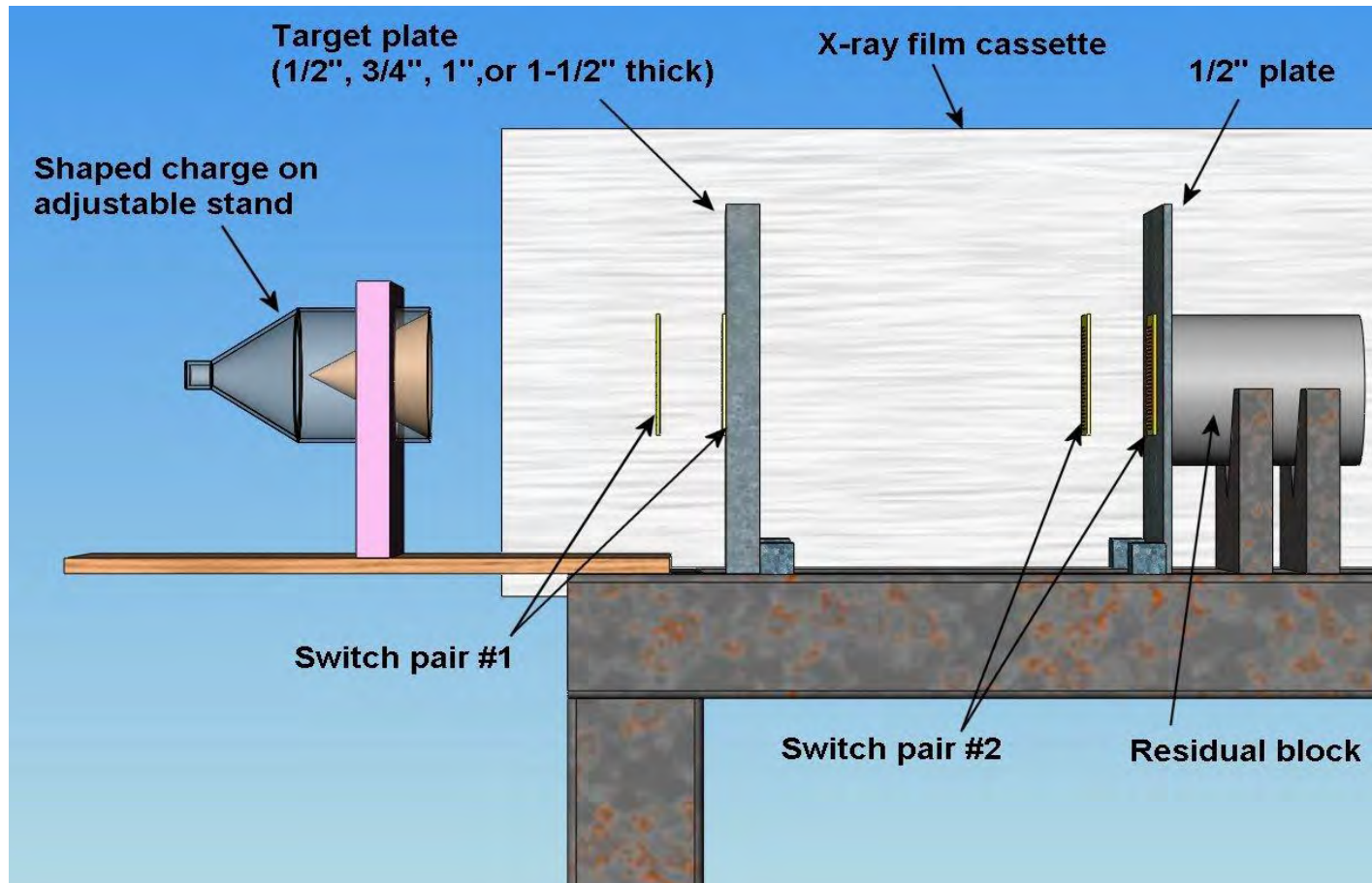
# Additional Support to EOD

- Technical Support Groups
- Equipment Testing

# TSG Mission

- Provide training in radiological detection and monitoring to designated personnel.

- Conduct test and evaluation of Radiological detection equipment.

# TSG Locations

- Washington Technical Support Group
  - Located at Fort Belvoir, Virginia
  - Provides training for forces in CONUS
  - Conducts Test and Evaluation of Equipment
  - Supports other TSGs and NTNF
- European Technical Support Group (ETSG)
  - Located in Stuttgart, Germany
  - Conducts training of EUCOM designated forces
- Pacific Technical Support Group (PTSG)
  - Located in Pearl City, Hawaii
  - Conducts training of PACOM designated forces
- CENTCOM Technical Support Group (CTSG)
  - Located in Manama, Bahrain
  - Conducts training of CENTCOM designated forces

# Questions?

*Making the World Safer...*
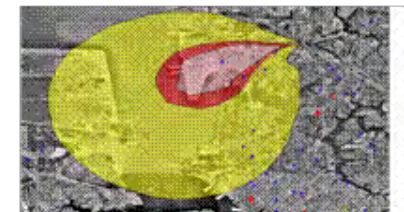


*...by combating weapons of mass destruction*

# European Defence Agency Building Collaborations in CIED

**Jim Blackburn**

**29 April 2010**

**European Defence Agency**

Building Capabilities for a Secure Europe

# Programme

- EDA Background

- Ongoing EDA Projects

- EDA CBRN

- EDA CIED

# Programme

- EDA Background

- Ongoing EDA Projects

- EDA CBRN

- EDA CIED

# EUROPEAN-US DEFENCE EXPENDITURE - GENERAL

| | Europe* | US** |
|---|---|---|
| **GDP:** | €11,3 Trillion | € 10,5 Trillion |
| **Total Defence Expenditure:** | €201 Bn | €491 Bn |
| **Personnel Expenditure:** | €110 Bn | €100 Bn |
| **Operations & Maintenance:** | €43,3 Bn | €169,2 Bn |
| **Equipment Procurement:** | €29,1 Bn | €83,0 Bn |
| **Research & Development:** | €9,7 Bn | €58,0 Bn |
| (Includes: Research & Technology): | €2,6 Bn | €13,6 Bn |

- *Europe means 26 EDA participating Member States

- **Euro/Dollar exchange rate is based on average for 2006: rate of 1,2556

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# Collaboration



European Collaborative Equipment Procurement as a Percentage of Total Equipment
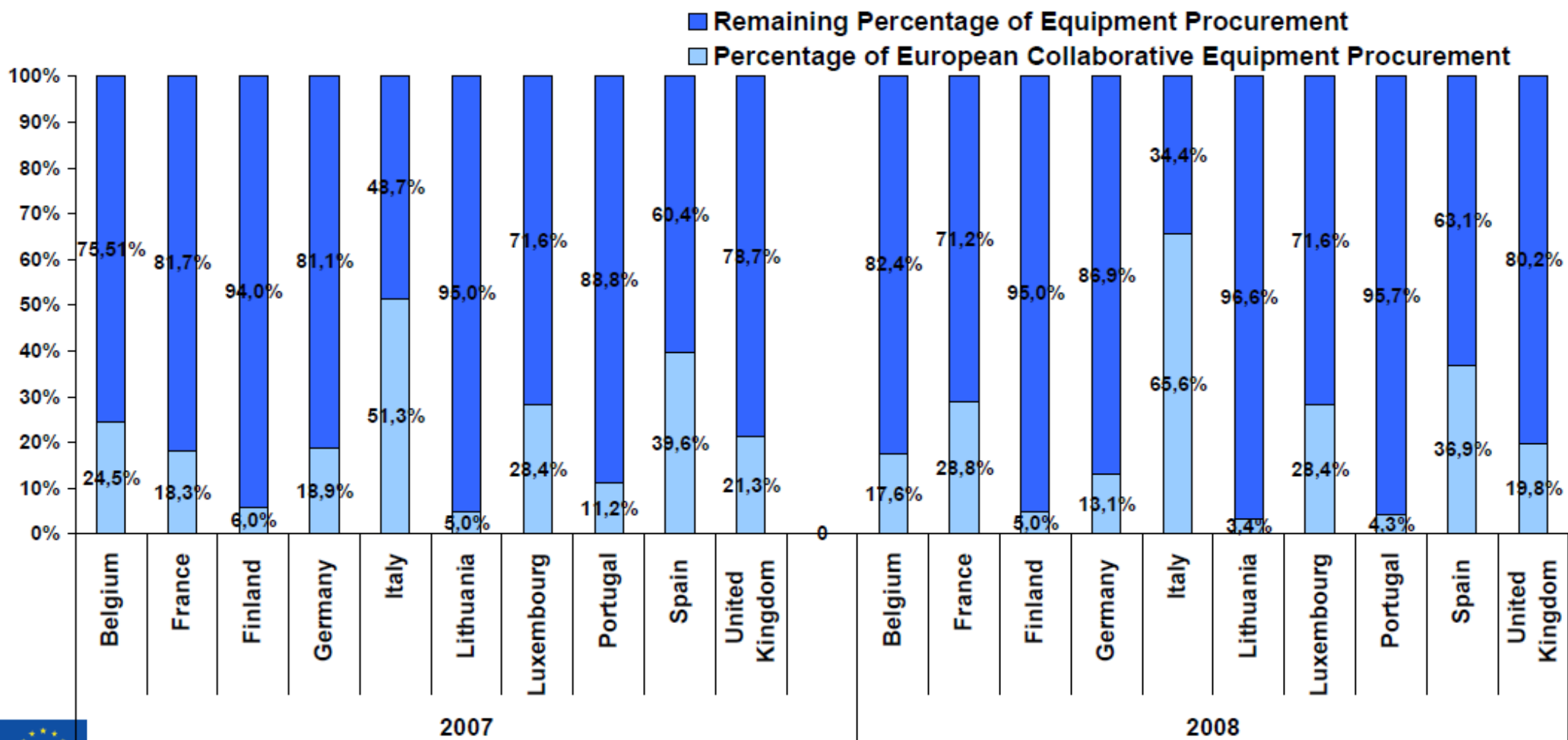
# EDA Participating Member States pMS

# Participating Member States



EDA

NATO

**Partnership for Peace (PfP) States:**

AT
FI
SE
IE
MT

CY

BE
DE
RO
ES
FR
UK
CZ
HU
PL
BG

LU
NL
PT
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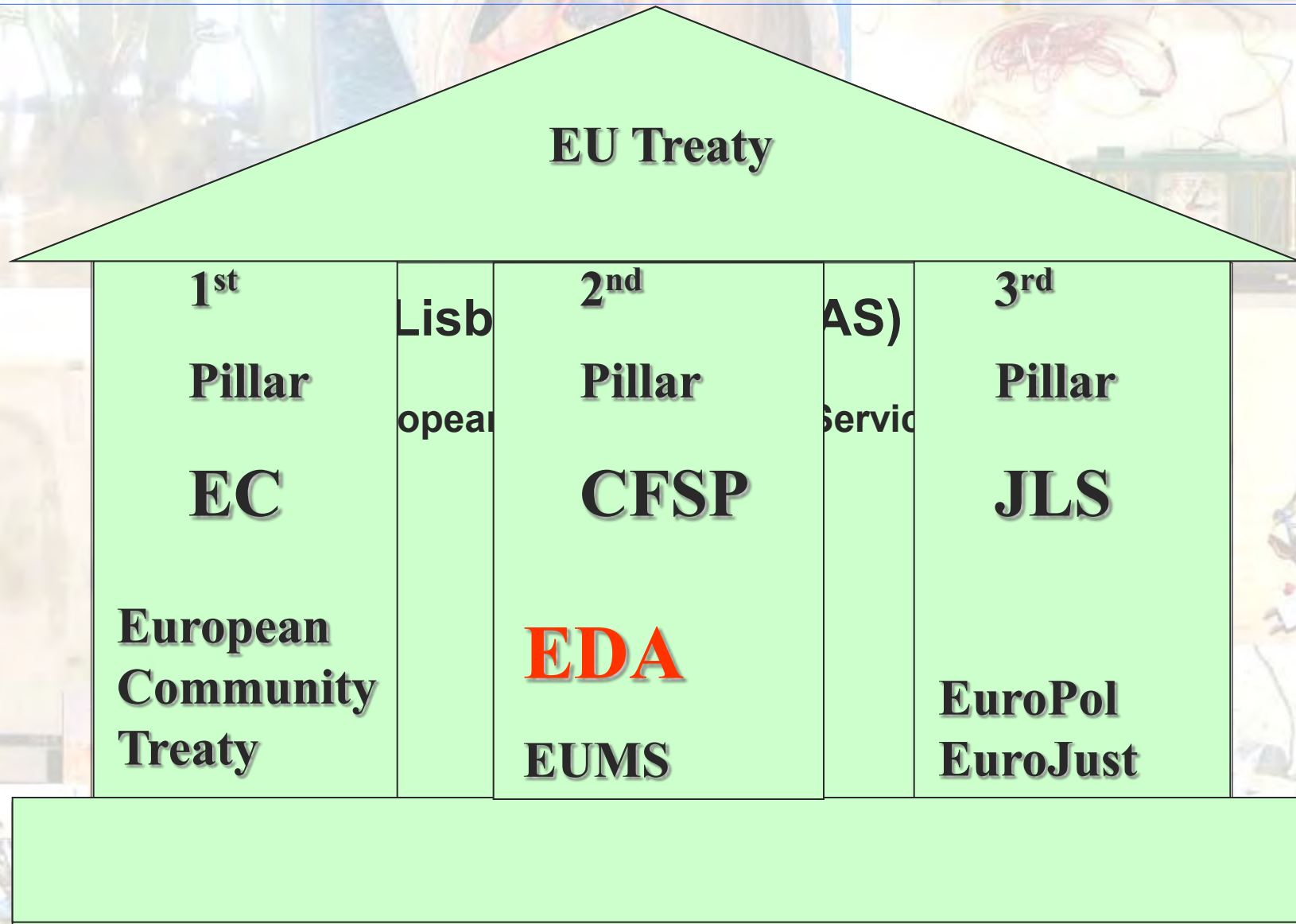ET
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ISAF

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# The EDA in the European Institutions

EU Treaty

| 1st Pillar | Lisb | 2nd Pillar | AS) | 3rd Pillar |
|---|---|---|---|---|
| **EC** | opean | **CFSP** | Servi | **JLS** |
| European Community Treaty | | **EDA** | | EuroPol EuroJust |
| | | EUMS | | |

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# Mission and functions

Development of defence capabilities
in the field of crisis management

"… to support the Council and
the Member States in their effort to
improve the EU's defence     capabilities
in the field of crisis management
and to sustain the ESDP as it stands
now and develops in the future."

**Improve the EU's defence capabilities**

Promotion & enhancement of
European armaments cooperation

Enhancement of effectiveness
of European Defence Research
and Technology (R & T)

Strengthening DTIB for the creation of an
internationally competitive
European Defence Equipment Market

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# EDA Structure
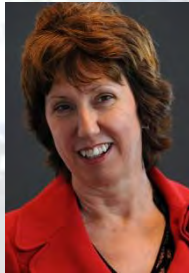
**HR Baroness Ashton Head of EDA**

**Chief Executive**

**Media / Comms**

**Planning / Policy**

**Deputies Chief Executive**

**Director R&T**

**Director Armaments**

**Director Capabilities**

**Director Industry/Markets**

**Director Corporate Services**

# EDA Background

- Small Agency approximately 110 people

- Small budget only for enabling activities

- Only exists for member states to enhance their capabilities

- No inherent EU Capability is being built – resides entirely in Member States

- Can only do what member states want to do

- Collaborative Forum

- Can inject proposals

# Programme

- EDA Background

- Ongoing EDA Projects

- EDA CBRN

- EDA CIED

# EDA Industry & Markets

- European Defence Equipment Market EDEM

- European Defence Technological and Industrial base EDTIB

- Electronic Bulletin Board EBB
  - Code of Conduct ( > 1 M€)
  - Code of Best Conduct in the Supply Chain

# Armaments Cooperative Strategy

- More and Effective Cooperation
  - Promote Cooperative Programmes
  - Ensure the future of the EDTIB
  - Improve effectiveness and efficiency
- Strategic Approach
  - CST, CSR & CPP
- Setting the Preconditions
  - Harmonised Military Requirements
  - Member States Share Plans

# Armaments Cooperative Projects

- On Going efforts
  - European Secure Software Radio
  - Mid Air Collision Avoidance System
  - Active Protection Systems for Armoured Vehicles
- Category B
  - Multinational Space based Imagery
  - Naval Mine Counter Measures
  - BIO EDEP
  - Heavy Lift Helicopter
  - Helicopter Availability

# Armaments Transversal Issues

- Military Airworthiness

- European Defence Test and Evaluation Base

- Matchmaking Database

- SDR Certification

- Armaments Strategy

- EDA / OCCAR Interface

- Standardization

# EDA R&T – 12 technological areas

- Capability-Technology Area = CapTech

- 12 CapTechs in 3 major blocks reflecting Capabilities

- IAP = Information Acquisition & Processing
  - ----> *Knowledge*

- GEM = Guidance, Energy & Materials
  - ----> *Engage*

- ESM = Environment, Systems and Modeling
  - ----> *Manoeuvre*

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# EDA R&T – 12 technological areas

| Information, Acquisition & Processing | Guidance, Energy & Materials | Environment, Systems & Modelling |
|---|---|---|
| IAP01 Components | GEM01 Materials & Structures | ESM01 Naval Systems & their Environment |
| IAP02 RF Sensor Systems & Signal Processing | GEM02 Energetics, Missiles & Munitions | ESM02 Aerial Systems & their Environment |
| IAP03 Optical Sensor Systems & Signal Processing | GEM03 Ground Systems & their Environment | ESM03 Systems of Systems, Space, Simulation & Experiment |
| IAP04 CIS & Networks | GEM04 Guidance & Control | ESM04 Human Factors & CBR Protection |

**R&T Directorate : 16 people**

# EDA Research & Technology

- Ad Hoc Cat A
  - JIP FP
    - 20 Contributing members (inc NO)
    - joint budget 55M€.
    - 3yrs initial programme.
    - 8 contracts let to date
  - JIP ICET
    - 11 cM (including NO)
    - Joint budget 15.58M€
    - Call 1 resulted in the selection of 4 proposals that are contracted in Q4/2009.
    - Call 2 ended 16 October 16 2009
- Ad Hoc Cat B projects
  - Contract signed – 26
  - Awaiting contract – 3
  - In preparation – 22
- OB R&T Contracts – 5 total value 1.4M€

# Integrated Development Teams (IDT) Project Teams (PT)

KNOWLEDGE

ENGAGEMENT

MANOEUVRE

COMMAND

INFORM

PROTECT

ENGAGE

DEPLOY

SUSTAIN

## Integrated Development Teams
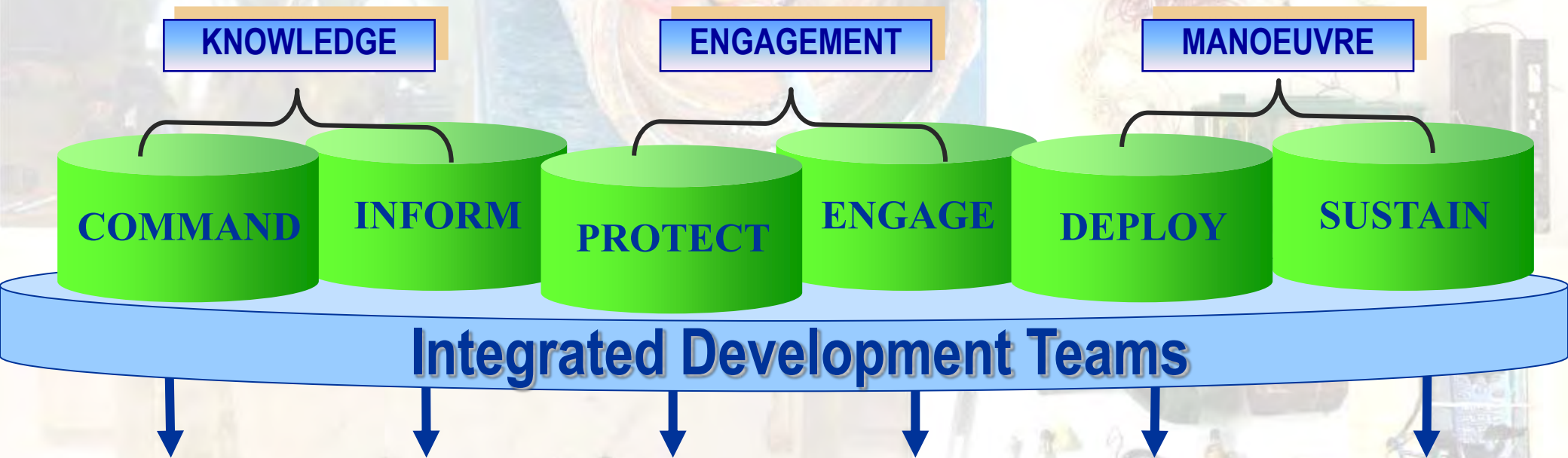
## Project Teams

**Various Lines of Development:**

• Concepts & Doctrine (e.g. NEC, ISTAR Architecture, CBRN Detection, Seaborne Logistics, etc.)

• Training (e.g. Intelligence Understanding of Mission Environment, Helo Pilots Advance Training, etc.)

• Armament Cooperation (e.g. Maritime Airborne Unmanned System, 21 Cent. Soldier System, etc.)

• Operational Cooperation (e.g. Radio Spectrum Management, Information Management, etc.)

• Industrial Cooperation (e.g. Third Parties Logistic Support, etc.)

# Programme

- EDA Background

- Ongoing EDA Projects

- EDA CBRN

- EDA CIED

# CBRN

- PT CBRN DIM

-  Ad Hoc Project Cat B BIO EDEP PREP

- PT CBRN CM

- PT CBRN EOD

# PT CBRN EOD

- Taken over from the Equipment Capability Programme (ECAP) in the Western European Armaments Group (WEAG)

- Made significant Progress in concepts, training and standardisation.

- Looking to move into wrap everything together into a Common Staff Target to present this to a package to the Member States.

- Will still take forward RDD, IND and MNT.

# Programme

- EDA Background
- Ongoing EDA Projects
- EDA CBRN
- EDA CIED

# EDA CIED

**Aim**
- Develop capabilities in common
- Better use resources and ensure that a plan and staff structure exists for ESDP operations; in order
- Enhance capability of the pMS to Counter an IED Campaign.

**Strategic Context**
- One of the top 12 CDP actionable points.
- Many pMS involved in current operations involving IEDs.
- Capability Development needed quickly, but enduring.

**PT Members** AT, BE, CZ, DE, EE, **ES**, FI, FR, IE, IT, NL, PL, RO, SE, SK, UK

**3rd Parties**
- EU Commission
- EU Council
- EuroPol
- NATO

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# Guidelines for Developing a National CIED Capability

💣 **Search**

💣 **Exploitation** / Weapons Intelligence

💣 **Route Clearance**

💣 **IEDD** (Including **Manual Neutralisation Techniques**)

💣 **Mitigation**

💣 **TTPs**

💣 **ECM**

**Defeat the System**

# Current & Planned Work

- CSDP Concept

- EU Commission to conduct an overarching review of EU CIED multi-nationally and multi-agency. (Civ / Mil) – Proposals for examination.
  - Level 3 CIED Exploitation (EU)
  - Information / Intelligence Sharing
  - Interoperable Framework,  Common Capability Requirements
  - Common Standards
  - External links

- Manual Neutralisation Techniques
  - Kick off meeting 27 Jan
  - 2010 - Awareness Training
  - 2011 – Exercise

- Lessons Learned 8 & 9 June 2010

# Search Route & Clearance

- **Search continue 5 year plan**
  - **2009 – Intermediate TTT Course Rome.** **Complete**
  - **2010 – Advanced Search Advisors Course: 5 – 30 Jul.**
  - **2011 – Basic Search TTT.**
  - **2012 – Specialist Search.**
  - **2013 – CBRN Search.**
  - **Fits with Italian National Plan**
  - **Courses run at Italian National CIED COE (Eng School)**
  - **Run by Ex-Brit Mil RESA s**
  - **EDA funded for pMS**

- **Route Clearance**
  - **Kick Off 10 June 2010 TALISMAN Briefing**
  - **pMS to express interest by end May**
  - **Possible IT lead**

# Exploitation

- **Level 3**
  - Discussed in Overarching EU CIED Review
  - Currently 1 Bespoke Laboratory in the EU (UK)
  - National Crime Laboratories.

- **Level 2**
  - EDA may spend 1m€ on Laboratory (demonstrator) this FY
  - France as Lead Nation
  - CSDP Pooled Asset
  - Could be made available to ISAF

- **Level 1 - Nil**

# Potential CIED Exercise 2011

- Exercise format to be agreed

- Possible multiple vignettes
  - Strategic Civ / Mil over view seminars
  - Operational Exercise of CIED Staff Branch
  - Tactical level scenarios for CIED based on
    - Search
    - IEDD (Including MNT)
    - Scene Management
    - Exploitation

- To follow and build on IE CIED (IEDD)

- Possible venues being examined

# EDA Role

- Providing a collaborative platform for pMS to develop capabilities
  - Coming together to fulfill "National Responsibilities"

- EDA Can:
  - Address conceptual issues, but not doctrine.
  - Establishment of training courses and running of 1 off pilot training.
  - Reach agreement on pan-European standards
  - The in depth development of 1 off capabilities and capacities
  - Provide a platform for pMS to find "Economies of scale" in training
  - Work on Category B Programmes
  - Be responsive to pMS requirements.

- EDA Cannot:
  - Provide on going enduring training
  - Be seen to be work FOR NATO, but MUST work WITH NATO
  - Work specifically for single or exclusive groups of Member States (within reason)

# *THE DEPARTMENT OF DEFENSE*

# *Defense, Diplomacy and Development*

Colonel Leo Bradley

Chief, Explosive Ordnance Disposal & Humanitarian Mine Action
OASD Partnership Strategy & Stability Operations

# Office of the Secretary of Defense
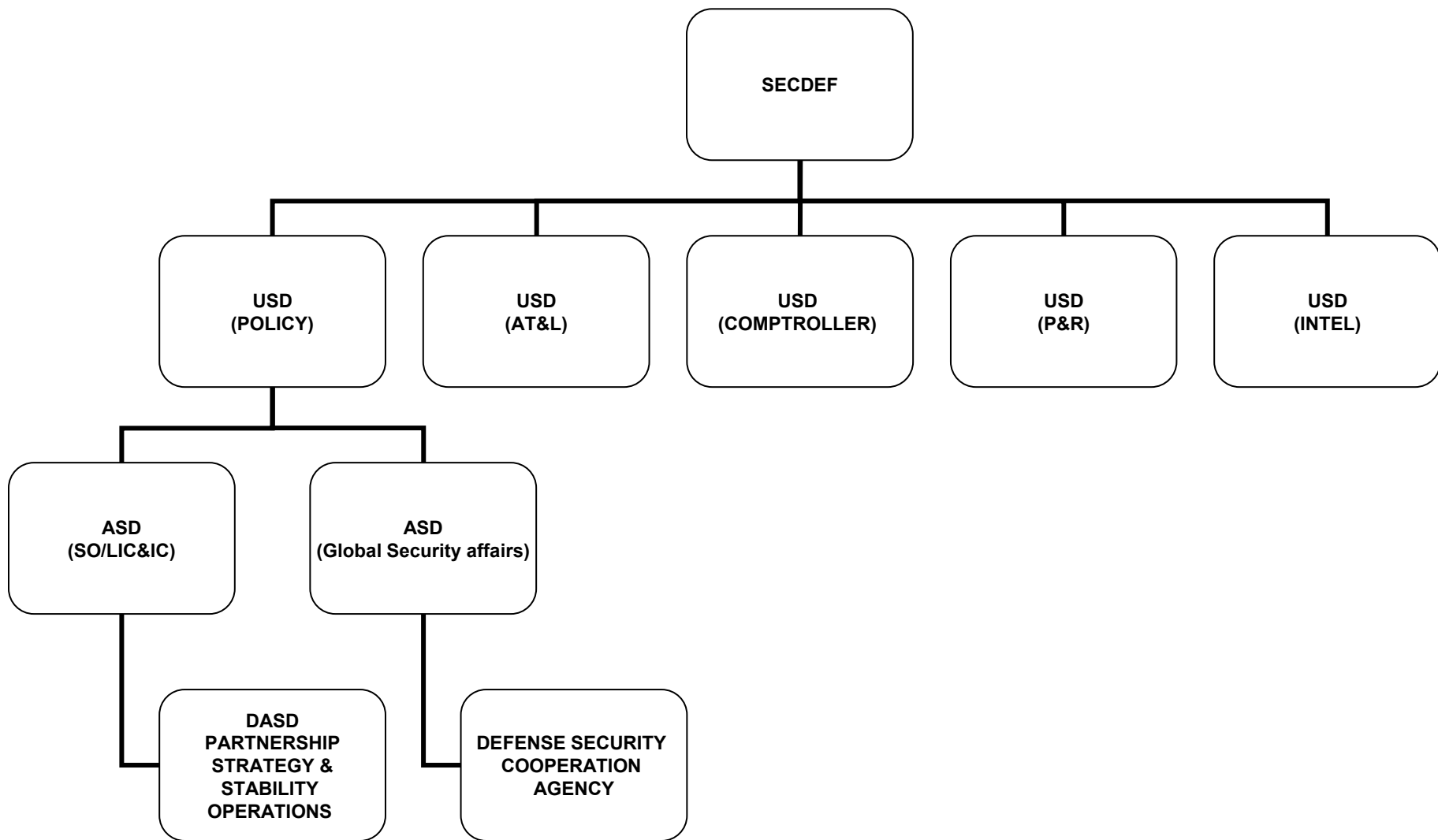
# Definitions

❑ **<u>Explosive ordnance disposal:</u>** (JP 1-02, NATO) The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded explosive ordnance. It may also include explosive ordnance which has become hazardous by damage or deterioration. Also called **EOD.**

# **Definitions**

❑ **explosive ordnance** (JP1-02, NATO): All munitions containing explosives, nuclear fission or fusion materials, and biological and chemical agents. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket, and small arms ammunition; all mines, torpedoes, and depth charges; demolition charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature.

❑ **unexploded explosive ordnance** (JP1-02, NATO) Explosive ordnance which has been primed, fused, armed or otherwise prepared for action, and which has been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material and remains unexploded either by malfunction or design or for any other cause. Also called UXO. See also explosive ordnance. (JP 3-15)

# Definitions

- **<u>explosive ordnance disposal procedures</u>** (JP 1-02, NATO) Those particular courses or modes of action taken by explosive ordnance disposal personnel for access to, diagnosis, rendering safe, recovery, and final disposal of explosive ordnance or any hazardous material associated with an explosive ordnance disposal incident.

  - a. access procedures — Those actions taken to locate exactly and gain access to unexploded explosive ordnance.

  - b. diagnostic procedures — Those actions taken to identify and evaluate unexploded explosive ordnance.

  - c. render safe procedures — The portion of the explosive ordnance disposal procedures involving the application of special explosive ordnance disposal methods and tools to provide for the interruption of functions or separation of essential components of unexploded explosive ordnance to prevent an unacceptable detonation.

  - d. recovery procedures — Those actions taken to recover unexploded explosive ordnance.

  - e. final disposal procedures — The final disposal of explosive ordnance which may include demolition or burning in place, removal to a disposal area, or other appropriate means.

# EOD Capability Development

Improvised WMD Disposal

Improvised Explosive Device Disposal (IEDD)

Bio/Chem/(Nuclear) Munitions Disposal (BCMD)

Conventional Munitions Disposal (CMD)

Identify, render Safe; TECHINT Exploit; Evaluate TTPs; Post Blast analysis; transport, disposal

Identification; assessment; determine hazard area; render safe; dismantle; leak seal and package for transport; TECHINT exploit; final disposal

Bulk Ammo disposal; Cache Disposal; CEA; ; Sub-munitions clearance; UXO Render Safe TECHINT exploitation; Ammunition Accidents/investigations, …

Increasing Technical Difficulty

Increasing Training Requirement

# EOD Partnering

- **EOD**
- **C-IED**
- **HMA**

# The ERW Problem

**Unsecured Explosive Ordnance is a Leading Cause of Global and Regional Instability**

# Mines and Development

❑ Landmines and other explosive remnants of war (ERW) impede post-conflict reconstruction and development efforts in many mine-affected countries because they:

- threaten community safety

- hinder the safe return of internally displaced persons (IDPs) and refugees to their communities

- damage infrastructure essential for economic development and increase rebuilding costs

- limit access to health care, education and other basic social services

- prevent the use of assets vital to sustainable livelihoods. For example, water sources, irrigation channels and land used for agriculture, grazing, housing/resettlement and commerce

- deter public and private investment and economic development through increased uncertainty, cost and delays resulting from suspect presence of landmines

GICHD Publication —Linking Mine Action and Development ODCA" November 2008

# Stability Ops: Disarm, De-mobilize, Reintegrate

**Armed Military/ Insurgent Forces**

Abandoned Explosive Ordnance (AXO)

Weapons/ Equipment

Munitions

Personnel

**Depot: Collect, inventory, Inspect, store, re-issue, dispose**

**Ammunition Depot: Collect, inventory, Inspect, re-issue, de-mil, dispose, store**

**Personnel: Identify, integrate into Armed Forces, re-train, de-mobilize, re-integrate**

UXO

Landmines

Disposal

Some Trained in EOD and demining

# Propellant Stabilizer Degradation
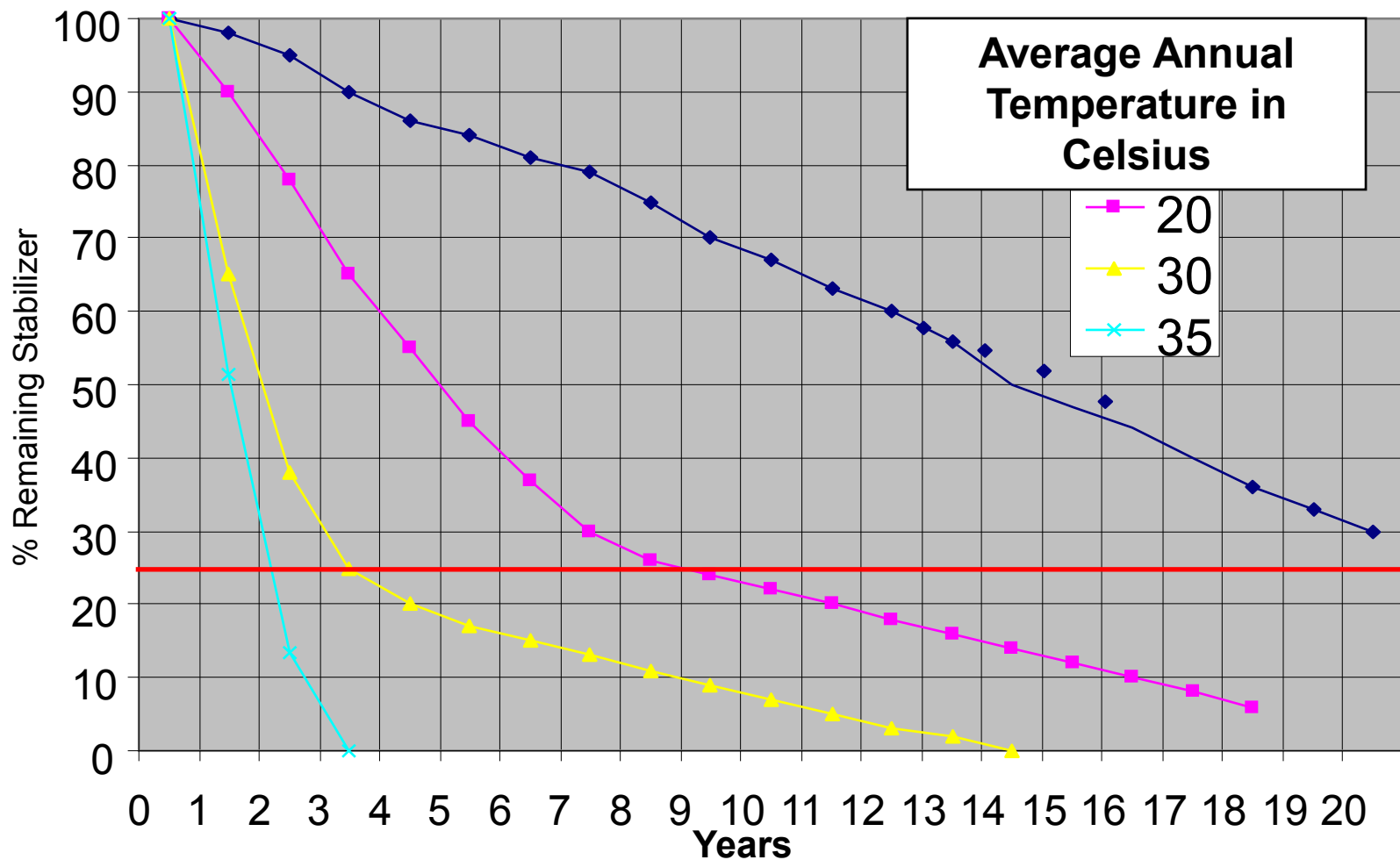
# Dangerous Depots

❑ **2008**

- 10 July - Kagan, Uzbekistan: 3 KIA, 21 WIA

- 3 July - Sophia, Bulgaria: 6KM evacuation

- 15 March – Albania:  24 KIA, 300+ WIA destroyed 400 homes

❑ **2007**

- 29 December - Medellin,  Columbia: 2 KIA, 7 WIA

- 26 July Aleppo – Syria: 15 KIA, 50 WIA

- 17 June - Mbandaka, Democratic Republic of Congo:  3 KIA, 52 WIA

- 7 April - Khartoum, Sudan: no reported casualties.  Airport closed temporarily

- 22 March - Maputo, Mozambique: 100+ KIA, 500+ WIA

# U.S. Tactical Explosive Mishaps

DOHA

FOB MAREZ

FOB FALCON

# DOD Humanitarian Mine Action

❑ **The DoD Humanitarian Mine Action Training Program**

- Authorized by 10 USC 407
- Planned and executed by GCC as part of TSC plan
- DSCA approves and funds through Overseas Humanitarian, Disaster, and Civic Aid (OHDACA) appropriations
- OSD SO/LIC&IC provides policy oversight and coordinates with DOS weapons removal and abatement program

❑ **Humanitarian Demining Research and Development (HD R&D) Program**

- Executed by Army's Night Vision and Electronic Sensor Lab
- Develops, demonstrates and validates demining technology
- Provides equipment prototypes to NGOs and partner nations
- Technology is evaluated against actual threats in real world environment

# DoD HMA Process
**Preconditions for U.S. Assistance**

❑ **Host Nation must submit a formal request for assistance through the U.S. Embassy**

- Hostilities have ceased
- Workable peace agreement is in place

❑ **USG Policy Coordination Committee (PCC) Sub-group on Humanitarian Mine Action**

- Chair – DoS, Office of Weapons Removal and Abatement
- Co-Chair – DoD, Office of Stability Operations Capabilities

❑ **Policy Assessment Visit (PAV)**

- Representatives from DoS / OSD / COCOM conduct PAV. Based on results of this visit, USG decides whether to initiate/restart a HMA program with that country.
- If approved, COCOM conducts a….

❑ **Requirements Determination Site Survey (RDSS)**

- …which identifies specific goals, objectives and resource requirements

# DoD HMA Process
**DoD Development of Country Programs**

- ❑ **Country Team and COCOM coordinate possible initiatives**

- ❑ **COCOM Prioritizes proposals and submits to OSD**

- ❑ **OSD staffs proposals with DoD/State/interagency and approves appropriate projects**

- ❑ **COCOM tasks units to execute projects**

- ❑ **Country team and COCOM evaluate effectiveness**

# Humanitarian Demining Prohibitions

**POLICY**

**No member of the US armed forces will:**

**"engage in the physical detection, lifting, or destroying of landmines or other explosive remnants of war (unless the member does so for the concurrent purpose of supporting a US military operation); or**

**provides such assistance as part of a military operation that does not involve the armed forces.**

**Title 10, United States Code, Section 407**

18

# HUMANITARIAN DEMINING TRAINING CENTER
## U.S. DEPARTMENT OF DEFENSE

**www.wood.army.mil/hdtc/**

**Angel Belen – Acting Director**

**Angel.belen@us.army.mil**

**573-563-6199**

# HDTC Role in HMA

❑ **Train U.S. Military Forces** to provide Train-the-Trainer Humanitarian Mine Action instruction in Mine Affected countries.

❑ **Collect and disseminate information** on Mine Action for U.S. Government agencies to facilitate execution of the U.S. Humanitarian Mine Action Program.

❑ **Provide SME in support** of U.S. Government Policy and Agendas

❑ **Train to the International Mine Action Standards**

# Demining Training Course

- ❑ Mine Identification
- ❑ Mine detection by visual means
- ❑ Mine detection operations and equipment
- ❑ Mine detection by probing
- ❑ Unexploded Ordnance Identification and Disposal
- ❑ Procedures for marking lanes and minefields

- ❑ Demolitions
- ❑ Booby Traps
- ❑ Demining Tools
- ❑ Demining Site Set-up
- ❑ Clearing Process
- ❑ Demining/Disposal
- ❑ Minefield Handoff

# Tactical Countermining VS. Humanitarian Demining

## ❑ Tactical countermining

- Focuses on enhancing force _mobility_
- Minefields must be rapidly detected in all possible conditions
- _Breaching_ provides for rapid clearance without the need to find every mine

## ❑ Humanitarian demining

- Detection of _each_ landmine more important than the speed of movement
- Goal of demining is to locate and destroy _all landmines/ERW_ within a large designated area
- _Economic considerations_ are important in deciding if and when a specific minefield will be cleared
- _Safety_ is the most important consideration
- _Casualties are unacceptable_

# Kagan ASP Response

❑ 21 Jul 08- ARCENT notified by Defense Attaché .

❑ Uzbeks requested three types of equipment: land mine detectors, water metal detectors, and bomb suits.

❑ DATT's guidance was —let's get there first with the most stuff."

❑ 03 Aug 08- Pre-Deployment Site Survey Team (2 pax) on site.

❑ 21 Aug 08- the Training Team (5 pax) with equipment arrived in Uzbekistan.

❑ 28 Aug 08 all Uzbek / USEMB objectives were met

# DoD Humanitarian Demining Research & Development Program

**www.humanitariandemining.org**

**Sean Burke – Program Manager**
**sean.burke@nvl.army.mil**
**703-704-1047**

# HD R&D Organization

**Assistant Secretary of Defense Special Operations and Low-Intensity Conflict**

**Night Vision and Electronic Sensors Directorate Countermine Division**

## Program Funding, Guidance

- **Provides Program Guidance and Oversight**
- **Approve requests for in-country assessments**
- **Approve requests for operational field evaluations**
- **Liaison with other Government agencies (DoS)**

## Program Execution

- **Determine Requirements**
- **Structure Program**
- **Develop/Demonstrate Prototype Equipment**
  - **Contracts with Industry**
  - **In-House Developments Using NVESD Personnel and Shop Facilities**
- **Perform In-Country Assessments**
- **Conduct In-Country Operational Field Evaluations**
- **Assist with Transition Prototype Equipment into Operational Use**
- **Inform demining community**

## A cooperative effort

# HD R&D Program Objectives

**Develop, Demonstrate, and Validate Technologies to be Used in International Humanitarian Demining by:**

❑ **Assessing Existing Technologies**

- • **Assess commercial off-the-shelf equipment**
- • **Integration of mature technologies (e.g. sifting implements)**
- • **Thorough evaluation of new technologies**

❑ **Developing New Technologies**

- • **Integrate, adapt, and modify commercial off-the-shelf equipment to particular demining missions**
- • **New development of equipment if no suitable commercial version exists**

❑ **Transitioning Technologies Into the Field**

# FY09 Operational Field Evaluations (OFEs)

**Iraq**
Sifting Technology

**Afghanistan**
HSTAMIDS
MANTIS
Orbit Sifter
Sifting Buckets

**Thailand**
Air Spade
Beaver
Peco Cutter
SDTT
Tempest
Uni-Disk

**PR - Vieques**
Nemesis M3

**Yemen**
Improved Backhoe

**Ecuador**
Long Tools
Tempest

**Cambodia**
Badger
Explosive Harvesting
HSTAMIDS (3 orgs)
Long Tools
MAXX+
Sifting Buckets
Storm
Tempest

**Vietnam**
Large Loop
MDA
Peco Cutter
Shinn/Birdseye Cutters
Walking Tractor

**Chile**
Air Spade
Multi-Tool Excavator

**Angola**
Air-Spade
Detonation Trailer
HSTAMIDS
JCB Loadall
Mine Stalker
RMC

**39 Systems in 10 Countries**

# AN/PSS-14



3.5"

Rx

Tx

Rx

Multi-Pattern Coverage

7"-7.5" coil
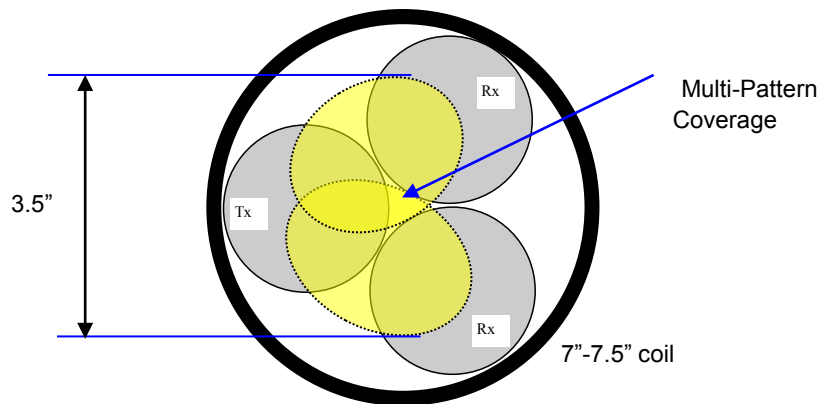
The HD program is upgrading the AN/PSS-14 dual sensor hand-held mine detector employed by U.S. Forces in OEF/OIF in order to provide better detection capability and enhanced training and tactics, techniques, and procedures (TTPs).



*SYSTEM OVERVIEW*

SPEAKER

WRIST STRAP

MAIN CRADLE ASSEMBLY

FOLD POINT

ELECTRONICS UNIT (EU)

3 SECTION EXT SHAFT

EARPIECE

ADJUSTABLE HAND CONTROL

BATTERY BOX

CAM-LOCKS

SENSOR HEAD

UNIT EST WT : 9.2 LBS
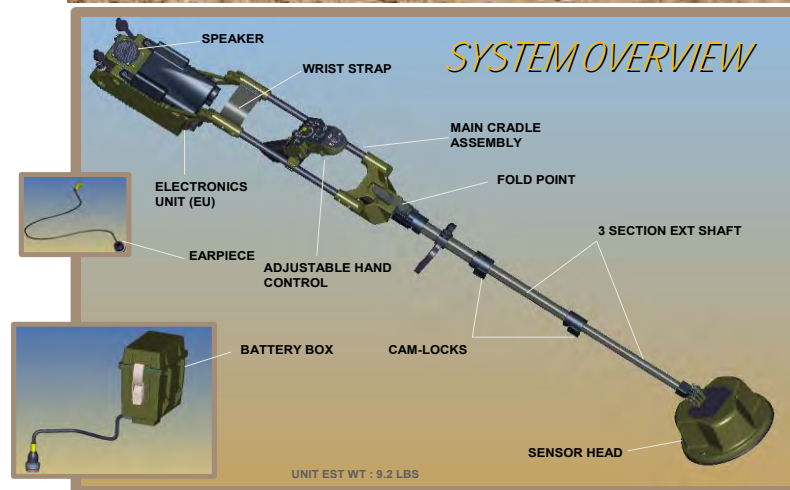
# Explosive Harvesting Program

- ❑ **De-mils excess ordnance into demo charges**

- ❑ **Meets almost all of the NGOs requirement for donor charges**

- ❑ **Produces scrap metal available for sale**





**Recycling weapons: how it works**

Removing explosives from abandoned or stockpiled munitions to create useful charges, used to safely detonate landmines and unexploded ordnances (UXO).

For example:    **Artillery shell**                    **RPG: Rocket propelled grenade**

First step: Is it safe?

Golden West workers inspect stockpiles to determine whether munitions are stable enough to be cut. If so, painted white and recycled. If not, painted red and destroyed.

Second step: Cut weapon open using a bandsaw.

Cut                                                    Cut

Third step: Steam out the explosive, if necessary.

Steam                                                Skip steaming

Fourth step: Cut explosive material into a charge.
(In some cases, the ordnance must be melted and recast into a charge.)

Second cut                                    Skip second cut, already a charge.

Done: Charges weighed, inventoried and stored.

Charge ready.                                    Charge ready.

Landmine and UXO destruction

# Explosive Harvesting Program

# Questions?

**COL Leo Bradley**
**Leo.Bradley@osd.mil**
**703-697-5607**

# NATO
# EOD Working Group
# Update

**Joint EOD and Search**
**Wg Cdr James Brudenell - Royal Air Force**

**EOD**
**WORKING GROUP**

# *SCOPE*

- Introduction to the NSO and NSA
- Military Committee Land Standardisation Board (MCLSB) Working Group (WG) Structures
- Development of NATOs C-IED Philosophy
- EOD WG priorities support to the current

C-IED Fight

EOD
WORKING GROUP
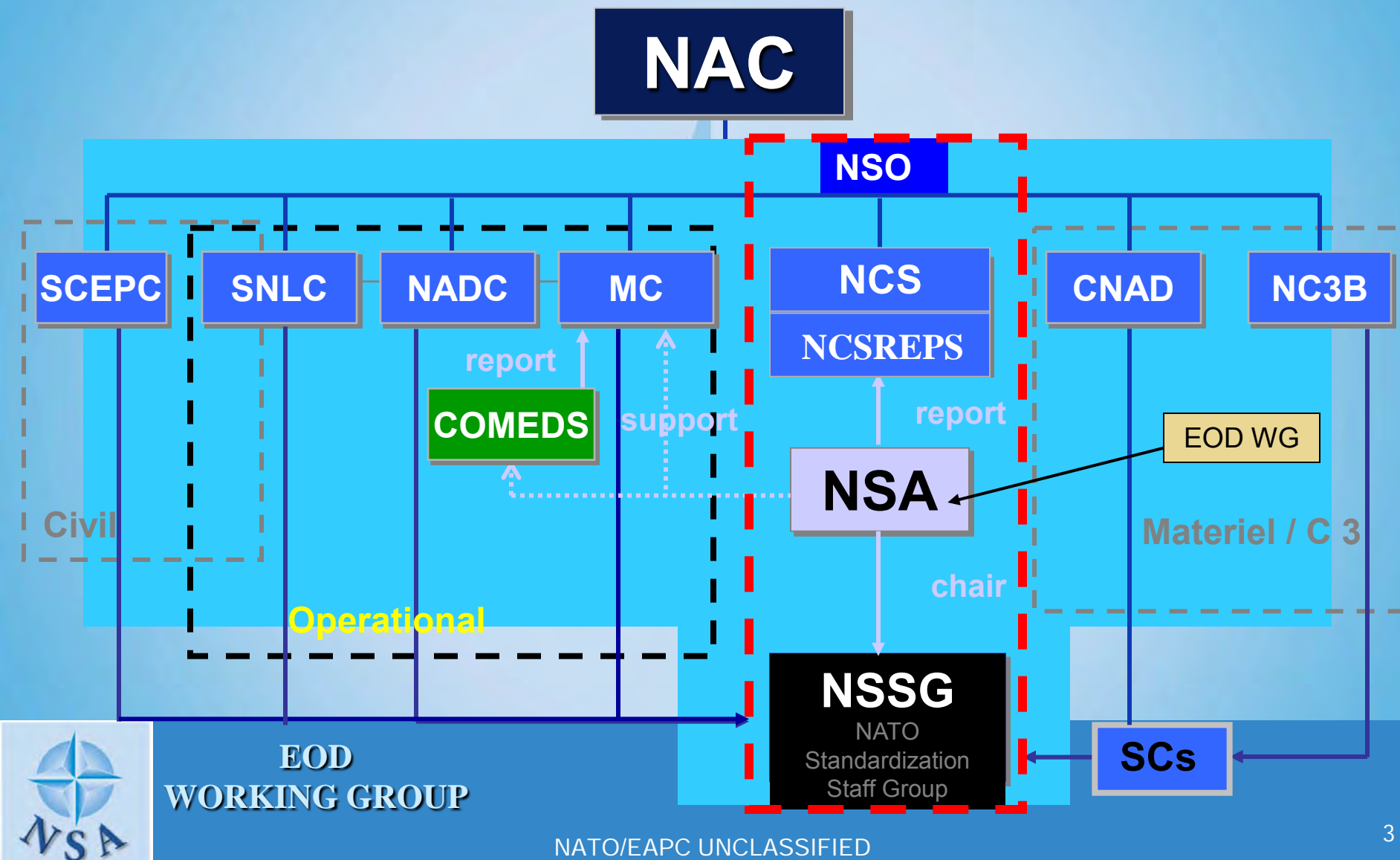
- *Why Standardisation?*

  To enhance the Alliance's operational effectiveness

- *Why Interoperability?*

  To allow forces and force partners to train, exercise and operate effectively together gaining the best results from resources used





**EOD WORKING GROUP**

# NATO Standardisation Organisation (NSO)

## Main Objectives

➢ **Alliance authority on standardisation and the focus for alliance standardisation efforts**

➢ **Develop and maintain NATO standardisation policy**

➢ **Identify and address priority areas for standardisation**

➢ **Contribute to standardisation requirements in NATO Force Planning**

➢ **Monitor the implementation of NATO Standards**

**EOD WORKING GROUP**

**To Improve Cooperation**

**To Eliminate Duplication**

**& so achieve**

# Interoperability

**To Improve Cooperation**

**To Eliminate Duplication**

**& so achieve**

# Interoperability

Greater Flexibility

Greater Operational Effectiveness

Shared Costs

**EOD WORKING GROUP**

# MCLSB EOD WG Structure



EOD WG

**EOD Doctrine Policy & Philosophy (DPP) Panel**
Chairman: DEU

**EOD Tactics Techniques, & Procedures (TTP) Panel**
Chairman: GBR

**EOD Informtion Panel (Info Panel)**
Chairman: CAN

**EOD Standardization Panel (Standards Panel)**
Chairman: USA

**DPP Panel:**
- STANAG 2143 Team — Team Ldr: GBR
- STANAG 2282 Team — Team Ldr: DEU
- STANAG 2377 Team — Team Ldr: GBR
- STANAG 2283 Team — Team Ldr: GBR
- STANAG 2293 Team — Team Ldr: GBR

**TTP Panel:**
- STANAG 2369 Team — Team Ldr: USA
- STANAG 2370 Team — Team Ldr: GBR
- STANAG 2391 Team — Team Ldr: GBR
- STANAG 2884 Team — Team Ldr: GBR
- Lessons Learned Team — Team Ldr: ESP
- CBRN Team — Team Ldr: BEL — Dev STANAG 2609
- STUDY 2607 — Team Ldr: GBR

**Info Panel:**
- EOD Info Tech Team — Team Ldr: USA
- STANAG 2186 Team — Team Ldr: USA
- IER Team — Team Ldr: FRA
- EODTIC Team*
  - EODTIC Operations
  - STANAG 2834 Team — Team Ldr: GBR
  - EODTIC Didgitization

**Standards Panel:**
- Terminology Team — Team Ldr: SVK/BEL — STUDY 2279
- Training & Proficiencies Team — Tem Ldr: GBR — STANAG 2389
- STANAG 2897 Team — Team Ldr: USA

EOD WORKING GROUP

# Countries Represented by NATO EOD WG Delegations

**19 countries represented total NATO membership of 28 independent countries**

**9 member countries not represented in the NATO EOD WG**

Belgium, Bulgaria, Canada, Denmark, Estonia, France, Germany, Greece, Italy, Netherlands, Norway, ,Portugal, Slovakia, Spain, Poland Romania, United Kingdom, United States, Turkey

Albania, Croatia
Czech Republic, Hungary, Iceland,
Czech Latvia, Lithuania, Luxembourg,
Slovenia

**EOD WORKING GROUP**

AAP-03/ AAP-52 / AAP-47

AAP-03

TASK / PROPOSAL

AAP-03 / AAP-47

REVISION

VALIDATION

STUDY DRAFT

AAP-03 / AAP-47

IMPLEMENTATION

PROMULGATION

APPROVAL

AAP-03

RATIFICATION

AAP-03 / AAP- 47

AAP-03 / AAP-47
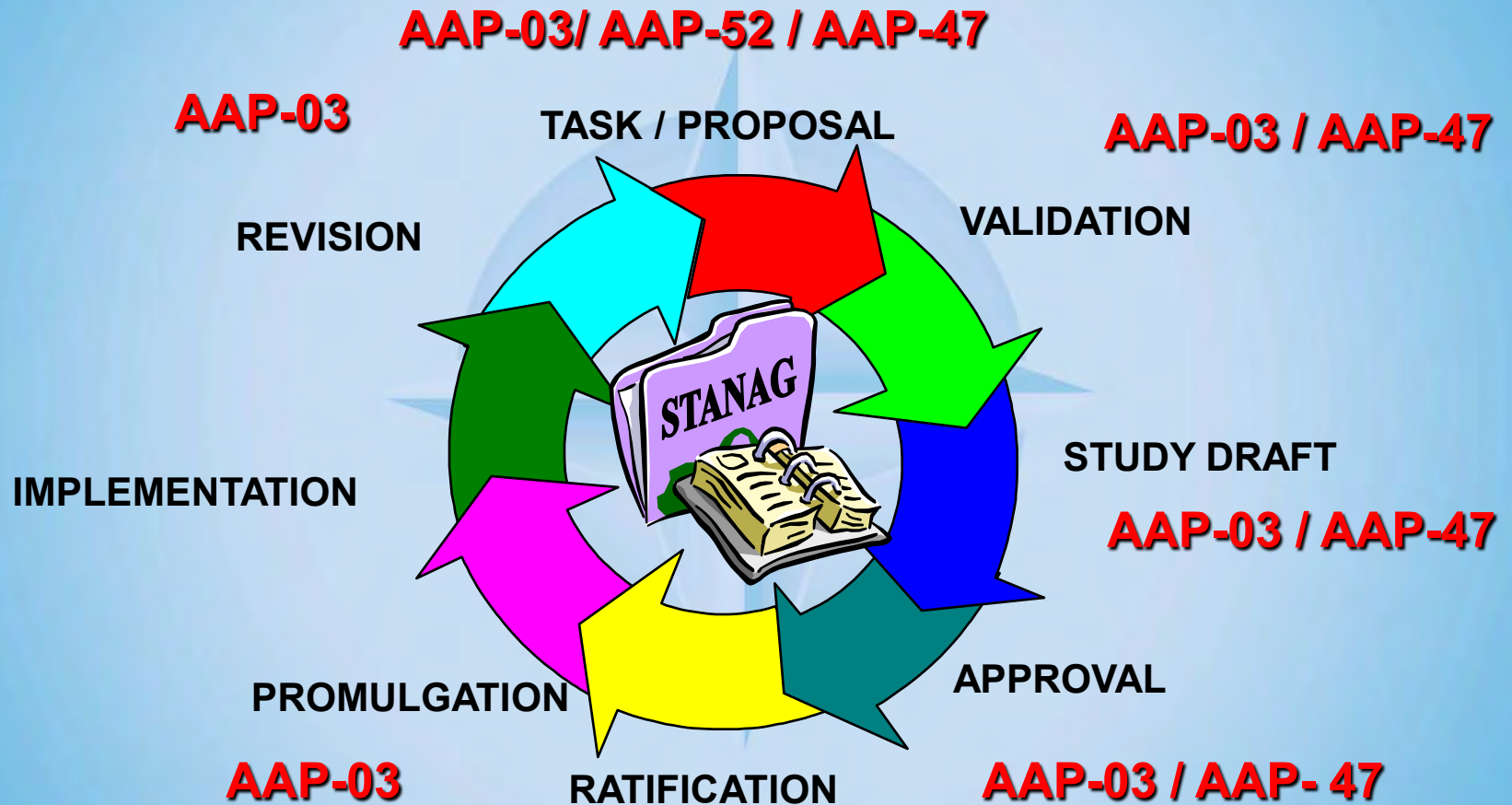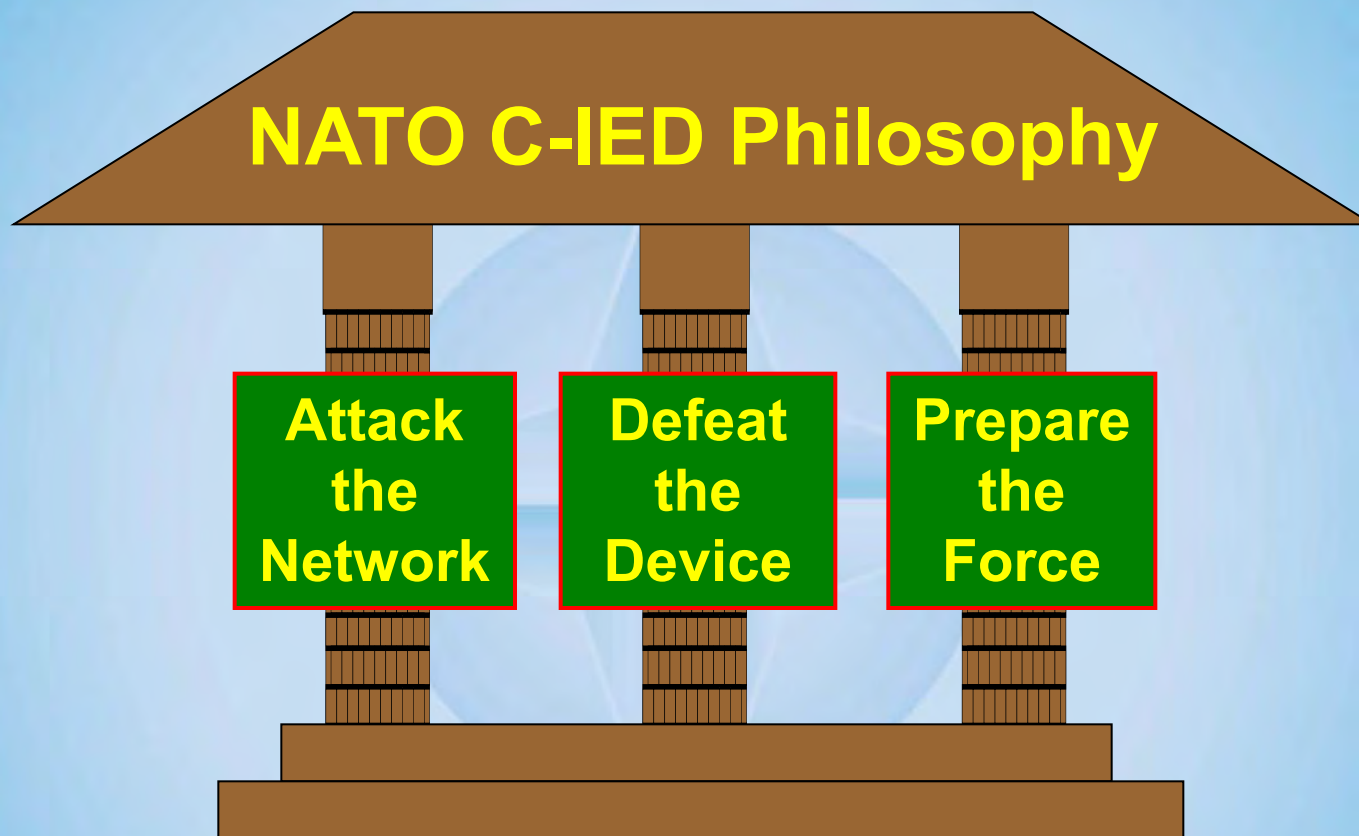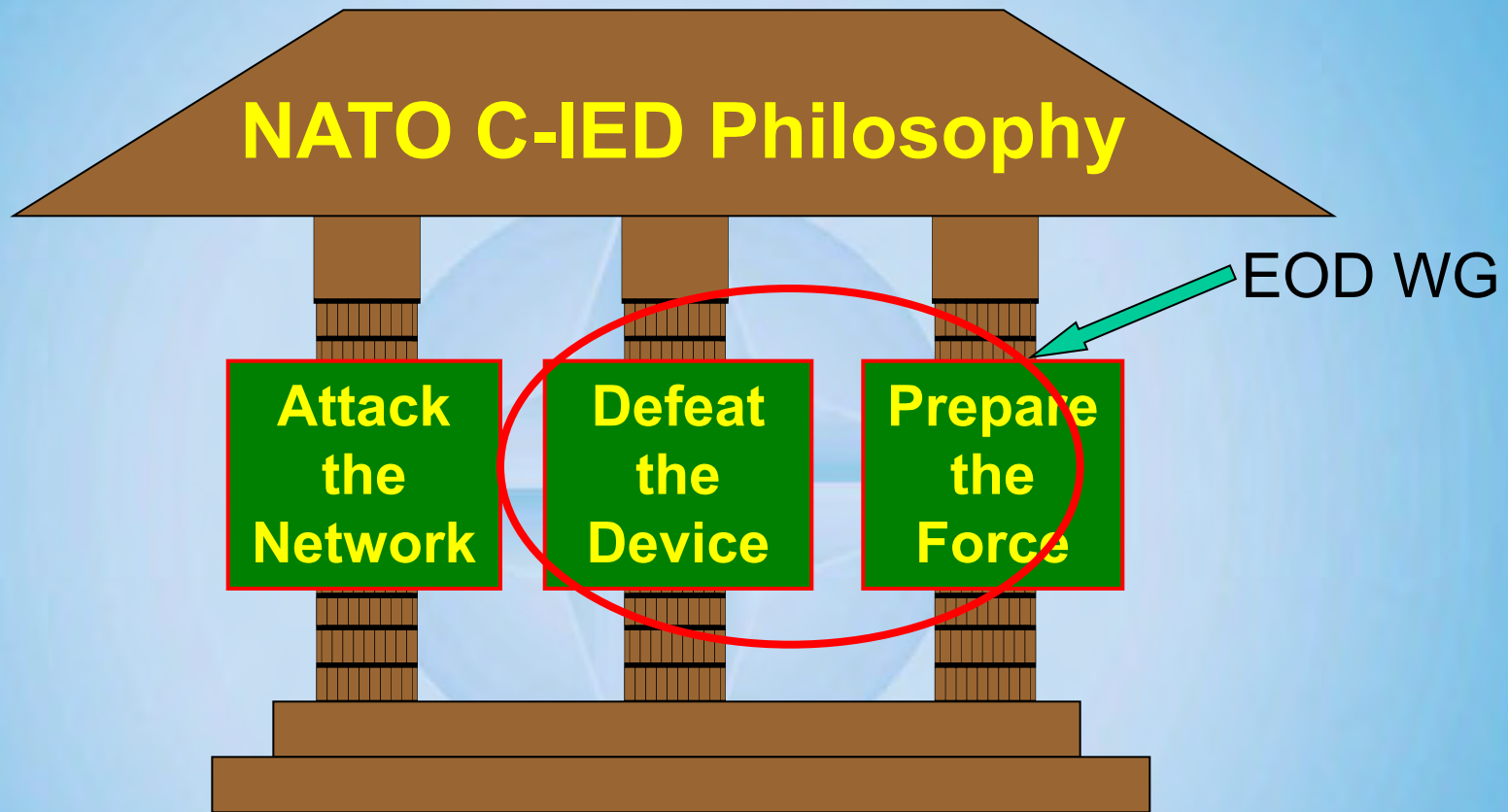
# *EOD WG Priorities*

- Explosive Ordnance Disposal Technical Information Centre - EODTIC
    - Digitisation
    - Transformation
    - Extended Membership



**EOD WORKING GROUP**

- STANAG 2293 Military Search Techniques and Procedures – ATP-73 Vol 2

- Completed draft process agreed to move to ratification draft 1 at the NATO EOD WG 12 – 16 Apr 2010

- Provides a sound publication for interoperability and capability development for nations looking to grow their own Search capability





**EOD WORKING GROUP**

## Offensive

• Gain Intelligence

•Deny Resources & Opportunity

•Secure material of possible Evidential Value

## Defensive

•Force Protection

•Protection of Pre-planned Events

•Protection of Critical Infrastructure





**EOD WORKING GROUP**

- Urgent requirement to improve Alliance understanding of ECM both FP and EOD on multinational Deployed Operations

- Study Draft V2 agreed at last EOD WG meeting 12 -16 Apr 2010

- Linked to UK development of a NATO EOD ECM Advisors Course


ECM Mastiff


Balter

**EOD WORKING GROUP**

- Ratification Drafts of Vol 1 (EOD Staff Officers Guide) and Vol 2 (EOD Operators Guide) submitted to nations for response by 4 Jun 10

- Following ratification, work will begin on SD Ed 3 of STANAG 2370 to harmonise documents across WGs relating to C-IED activity





**EOD WORKING GROUP**

# *EOD Lessons Learnt Process*

- Led by Spain on the TTP Panel
- The EOD LL Team have researched access protocol to NATO LL databases
- Identified some 36 LL's that are EOD relevant
- Address national access issues
- Distribute to National POCs for review
- Group discussion
- Implementation

**EOD WORKING GROUP**

- Study underway to identify the requirement
- Review the requirement against current systems both NATO and national level
- Identify a way forward measured against existing individual national security constraints
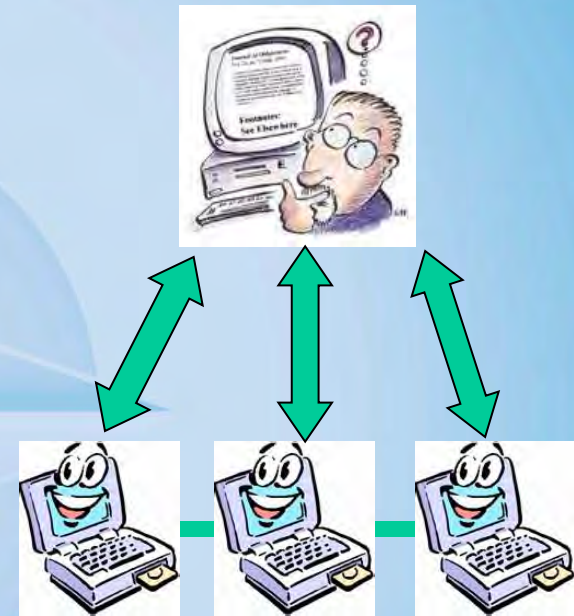
- STANAG 2369 - AEODP-6 (B) was promulgated in Dec 09
- Clears the way for the distribution by the US of the NATO EOD Publication Sets (NEPS)



**EOD WORKING GROUP**

- Standardisation & Interoperability are the enablers to NATOs delivery of effect.

- The EOD WG's Relationship & Interaction with the C-IED WG needs to be developed.

- EOD WG priorities are focused on the delivery of theatre effect:

  - Development of joint operations IEDD capability

  - Broadening of EOD EW capability.

  - Search.

  - Effective use of information.

# *Questions?*

EOD
WORKING GROUP

# Interagency Improvised Explosive Device Defeat

**Dr. Edwin A. Bundy**
**Program Manager**
**TSWG Improvised Device Defeat Subgroup and**
**EOD/LIC Program**

**Combating Terrorism Technical Support Office**

# EOD/LIC Mission

The Explosive Ordnance Disposal/Low-Intensity Conflict (EOD/LIC) program provides Joint Service EOD technicians and Special Operations Forces (SOF) operators with the advanced technologies and mission-focused solutions required to address current and emerging threats presented by unconventional and asymmetric warfare.

# Remote Operations and Advanced Mobility

- Develop capabilities to remotely approach, enter, and conduct reconnaissance operations in hazard areas and danger zones.
- Enhance mobility-related technologies and equipment to facilitate safely approaching, operating in, and withdrawing from hazardous environments.
- Develop systems and technologies to gather and store operational information for transmission to operational personnel and unit commanders.
- Improve technologies for the relocation of unexploded ordnance, hazardous materials, and improvised devices.

# Access and Disablement

- Develop tools to quickly and efficiently breach or gain access to structures, barriers, vehicles, and containers
- Develop chemical, mechanical, electrical, and explosively actuated systems for the neutralization and disruption of unexploded ordnance and improvised devices
- Improve technologies for rendering fuzing and firing systems inoperable

# Access and Disablement





Body
Relief valve
Lid / explosive cutter
Cover
Blasting cap holder
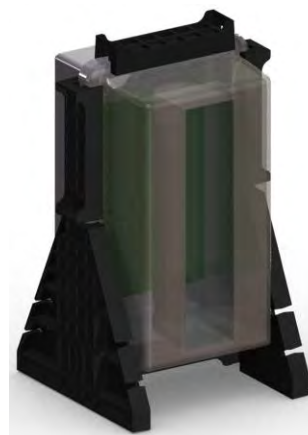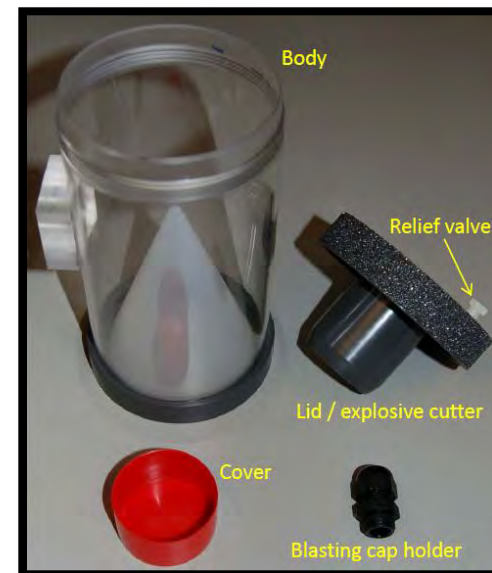
Cross-Section, 100 μs
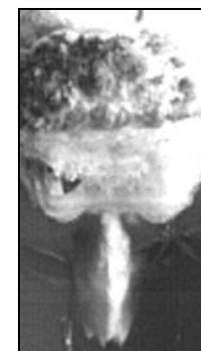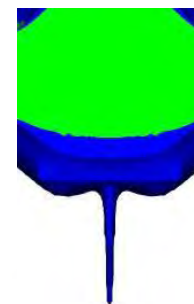
# Detection, Diagnostics, and Analysis

- Develop tools to locate and verify the presence of improvised devices, unexploded ordnance, booby traps, and other threats
- Develop technologies to determine the specific type, condition, and characteristics of unexploded ordnance and improvised device components, and the specific hazards associated with each
- Improve methods to analyze and evaluate improvised device construction

# Detection, Diagnostics, and Analysis

# Protective Measures and Effects Mitigation

Advance the development of personnel protection systems for operations in enhanced hazard environments. Develop novel and improved solutions to protect personnel and property from blast, fragmentation, and ballistic hazards.

# Sustainability and Operations Management

- Develop tools and equipment to enhance situational awareness and operational capability during incident response or direct action operations
- Develop human performance improvement tools that foster the advancement of knowledge related to unexploded ordnance, improvised devices, and hazardous environments
- Develop tools and training for conducting novel and advanced missions related to improvised devices and hazardous environments.

# Sustainability and Operations Management

# IDD Mission

Identify, prioritize, and execute research and development projects that satisfy mission critical needs, fill capability gaps, and address interagency requirements for advanced technologies to safely and effectively defeat improvised terrorist devices. Emphasis is placed on technologies to enhance the training and support of operational personnel in the location, identification, render safe, and disposal of homemade explosives, improvised explosive devices, and other emerging terrorist threats.

# Research Challenges

- In December 2008, the D-IED SC published, Research Challenges in Combating Terrorist Use of Explosives in the United States

- The report outlines ten challenge areas where concentrated research can be most beneficial in combating IED use in the homeland

Research Challenges in Combating Terrorist Use of Explosives in the United States

Subcommittee on Domestic Improvised Explosive Devices

December 2008
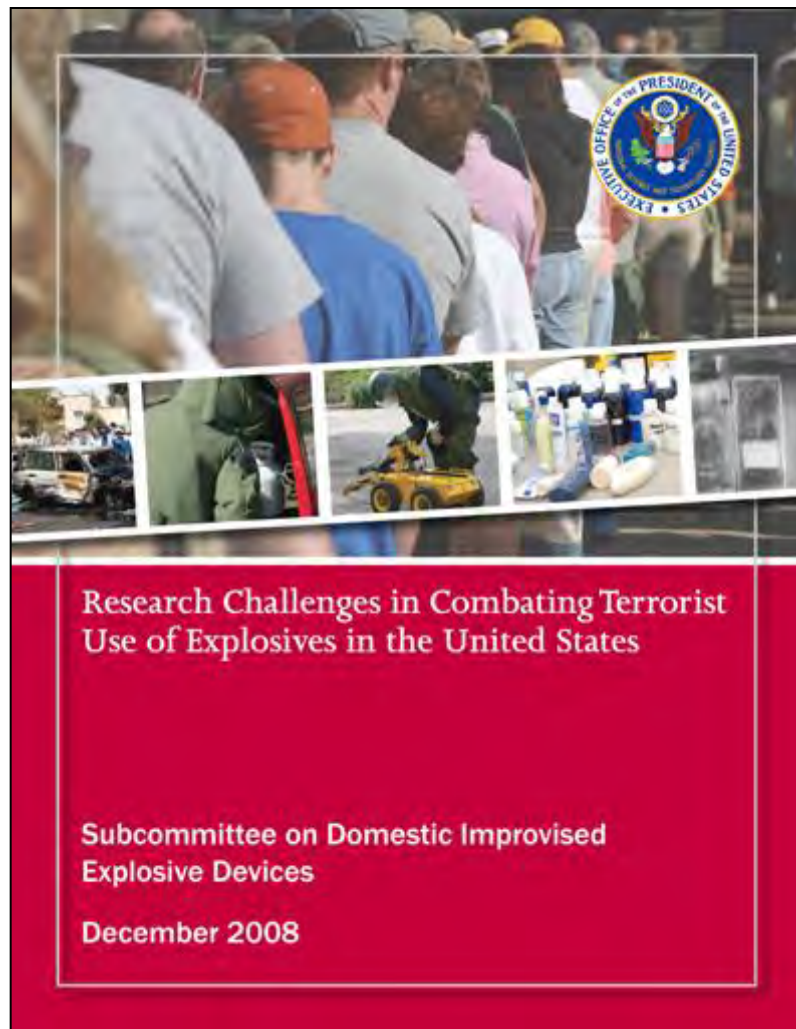
# Research Challenges

- C-IED Network Attack and Analysis
- Detection of Homemade Explosives
- Standoff Rapid Detection of Person Borne IEDs
- Vehicle-borne IED Detection
- IED Access and Defeat
- Radio Controlled IED Countermeasures
- IED Assessment and Diagnostics
- Waterborne IED Detect and Defeat Systems
- IED Threat Characterization and Signatures
- IED Warnings

# Device Defeat

- Develop advanced technologies to defeat the broad spectrum of improvised terrorist devices to include improvised explosive devices (IEDs), vehicle borne IEDs (VBIEDs), person borne IEDs, and enhanced hazard devices containing chemical, biological, or radiological materials
- Develop innovative, cost-effective disruption and precision render safe solutions that increase standoff distance, reduce collateral damage, and decrease risk to the improvised devices defeat operator
- Improve neutralization techniques for both sensitive and insensitive explosives and enhanced payloads such as flammable liquids and gases.

# Device Defeat
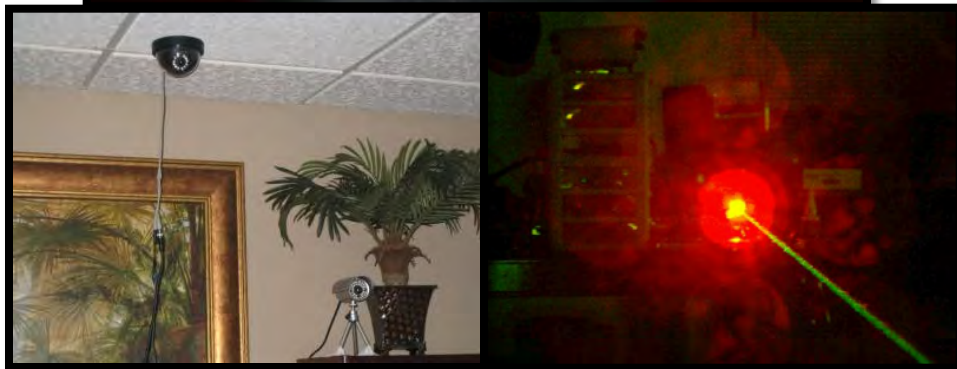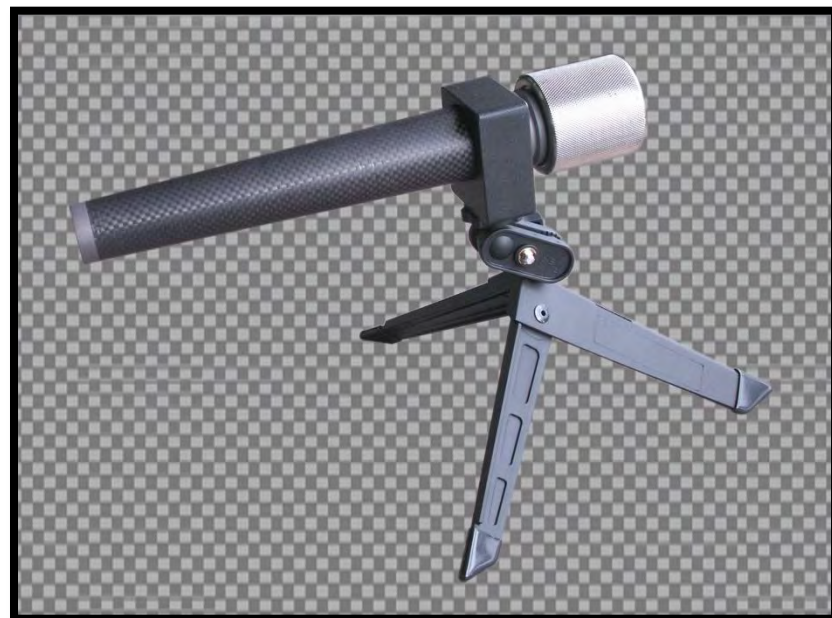
# Identification and Diagnostics

- Advance the capability of bomb technicians to interrogate unknown or suspect items and packages
- Develop technologies to locate and identify improvised devices and enhanced fillers, and diagnose key fuzing and firing components
- Develop tools to assist bomb technicians in the identification of U.S. and non-U.S. ordnance and firing systems incorporated into or modified for use in improvised devices

# Emerging Threats

- Advance production of effective countermeasures to neutralize or defeat radio-controlled IEDs and provide safe environments for bomb technicians
- Develop, characterize, and test technology solutions to safely and effectively render safe or neutralize devices containing improvised homemade explosives
- Develop, characterize, and test technology solutions to effectively render safe improvised devices using novel fuzing systems that incorporate such items as an electronic sensor, microcontroller, or mechatronic components

# Emerging Threats
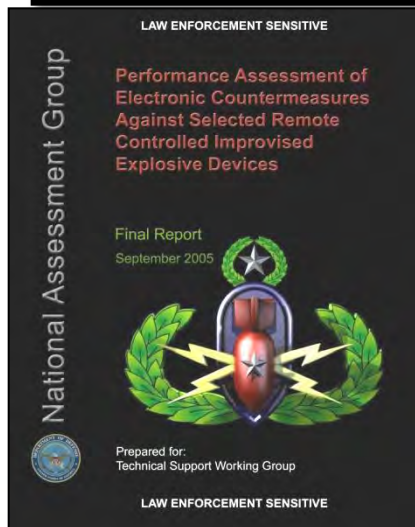
# Remote Procedures

- Develop advanced application systems to remotely access, diagnose, and defeat improvised devices
- Advance development of manufacturer and model-independent products and robotic tools with "plug and play" interface
- Develop open-architecture, navigation, communication, and operator controls for robotic platforms, tools, and sensors.

# Remote Procedures

# Tool Characterization and Information Resources

- Improve performance evaluation methodologies, test procedures, and tool characterization models for improvised device defeat technologies
- Conduct ongoing evaluation and improvement of tools, methods, and protocols for confirming the accuracy of detection equipment, reliability of diagnostic tools, and completeness of neutralization and safeing techniques
- Advance training concepts and information delivery systems that promote the tactical and operational response readiness required to effectively, safely, and efficiently counter improvised devices and emerging terrorist threats

# Maritime Security and Water-Borne IEDs

- Develop technologies to protect ships, boats, docking facilities, offshore platforms, shore-side loading facilities, power plants, bridges, and marine cables and pipelines from any form of terrorist attack

# Maritime Security and Water-Borne IEDs
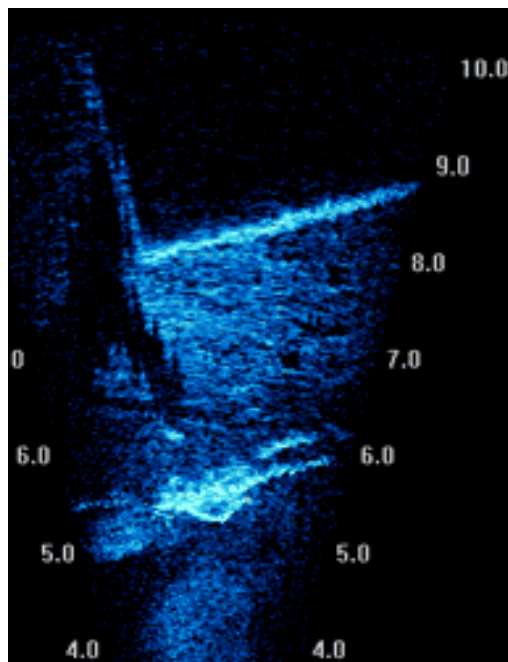


**DIDSON Sonar**



**Modular Unmanned
Surface Craft-Littoral
(MUSCL)**

# Summary

- User-focused approach to IED Defeat
- Seeking participation from other government agencies
- Solutions for both military and civilian bomb technicians
- Leveraging interagency and international contributions

**Contact information:**
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iddsubgroup@tswg.gov

NDIA Conference on Combating Terrorist Use of Explosives

# Science & Technology to Counter Improvised Explosive Devices

April 28, 2010
Ft. Walton Beach, FL

Ruth M. Doherty, Ph.D.
PEO Counter-IED
DHS Science and Technology Directorate
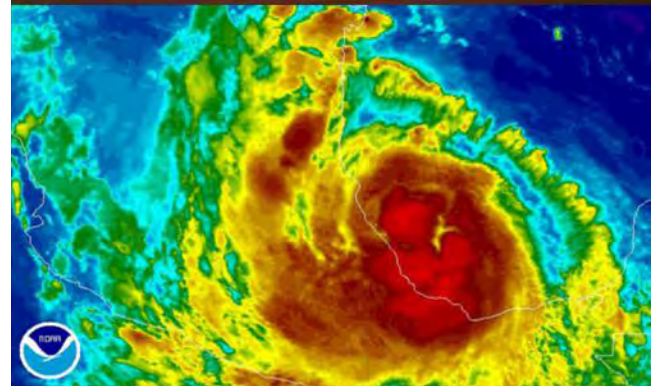
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# Counter-IED Challenge:

*Securing Special Events, Transportation Security and Beyond*

# U.S. Domestic Explosives Threats

- <u>Bomb threats</u> and <u>suspicious packages</u> in the U.S.
  - Over 2,300 since 2004*
  - Almost daily

- Terrorists continue planning explosives attacks in the U.S.

**"Use of a conventional explosive continues to be the most probable al-Qa'ida (domestic) attack scenario" said Director of National Intelligence to Congress Intelligence Committee, January 2007**

* ATF Bomb Data Center

# International Domestic Explosives Events

- Bomb threats continue worldwide
    - 82,000 terrorist incidents between 1970 and 2007 *
    - Top three terrorist targets:
        - Private Citizen's property 20%
        - Government                        17%
        - Business                          16%
    - 51% of time terrorists' tactic was bombing
- Over 600 IED attacks <u>per month</u> worldwide
    - Aug 2008 to Aug 2009 averaged
    - Data excluded Iraq & Afghanistan

* —Global Terrorism Trends", START presentation at the National Press Club on 14 September 2009.

# A Continuing Challenge

—Just as today's threats to our national security and strategic interests are evolving and interdependent, so too must our efforts to ensure the security of our homeland reflect these same characteristics. As we develop new capabilities and technologies, our adversaries will seek to evade them, as was shown by the attempted terrorist attack on Flight 253 on December 25, 2009. *We must constantly work to stay ahead of our adversaries*."

*Secretary Janet Napolitano*

*Quadrennial Homeland Security Review*
*February 2010*

**Homeland Security**

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# Military and Domestic

- Some transferable technologies
- Different environments, threats, procedures



- Constant threat
- Population restricted in movement
- Access to certain areas limited

Protecting Warfighters in Theater

- Countermeasures constrained by civil liberties and operations within an open and free society
- Homemade explosives proliferating world wide

Protecting Citizens in a Free and Open Society


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# Domestic IED Threat Domains

## Person-Borne IED
**Suicide bomber or leave behind bomb**

## Vehicle-Borne IED
**Parked vehicle or suicide attack**



**Rail**

**Public arena events**

**Border crossing or vehicle raveling to high-value target**

**Government Facilities**

**VIP events**

**Buildings, malls and National Monuments**

**Terminals**

**Seaport, ships and ferries**

**Utilities**
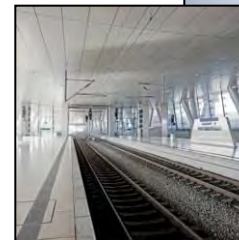
**Tunnels, bridges and dams**

7
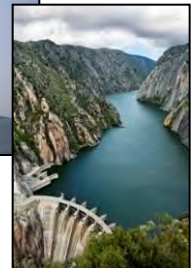
# Domestic Terrorist IED Attack Cycle



Decide to attack

Plan the Attack

Obtain Resources

Prepare for Attack

Conduct the Attack

BOOM

Observe Consequences

Attribute Responsibility

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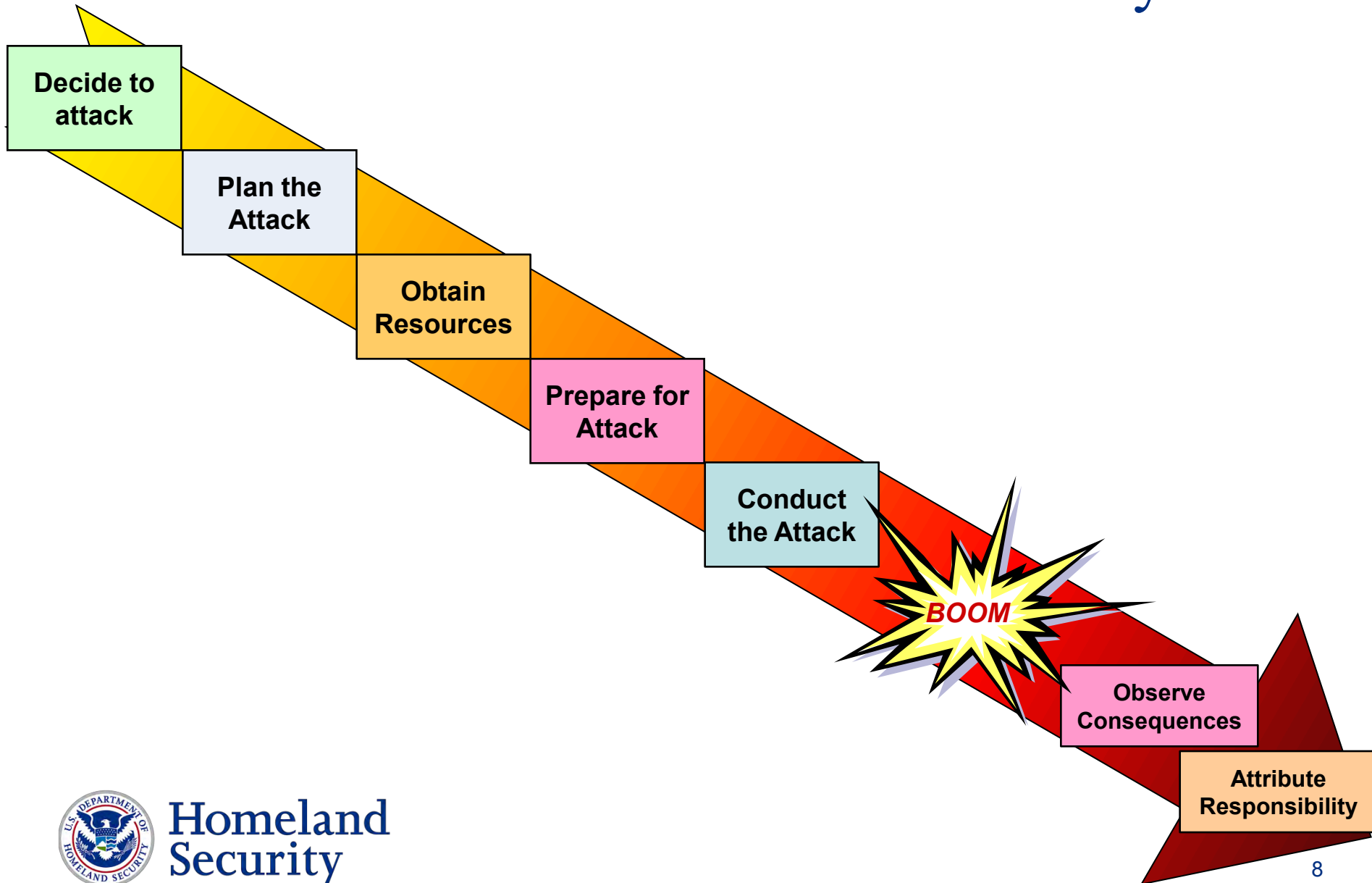
# DHS C-IED Investment Emphasis

•**Identify indicators of radicalization in the U.S.**

**Decide to attack**

**Prevent & Predict**

• **Evaluate programs to counter violent extremism**
• **Track suspicious behaviors and prioritize likely targets, staging areas, and ISR assets**

**Plan the Attack**

**Obtain Resources**

**Detect**

• **Detect, isolate, and inert/defuse IEDs without detonation**

• **Protect population, infrastructure**

**Prepare for Attack**

**Defeat**

• **Damaged structure stabilization**
• **Community resilience**

**Conduct the Attack**

**Mitigate**

*BOOM*

**Observe Consequences**

**Attribute Responsibility**

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# S&T Countering Domestic Explosive Threats Program

**Terrorist IED Attack Timeline**

*INTENT*    *INITIAL PLANNING*    *OBTAIN OPERATIONAL RESOURCES*    *CONDUCT OPERATIONS*    *ATTACK*    *IMMEDIATE EFFECTS*    *LONG-TERM EFFECTS*

## Prevent/Deter

**Actionable Indicators & Countermeasures**

- Community Characteristics
- Group Characteristics
- Pre-incident Behaviors & Rhetoric
- Integrated Framework
- Countermeasure Evaluation

## Predict

**Predictive Screening**

- Behavior Analysis
- Video Tracking
- Video Identification & Alert

**Risk Prediction**

- Target Prediction
- Staging Area Prediction

## Detect

**Person Borne IED**

- Suicide Bomber
- Leave-behind

**Vehicle Borne IED**

**Integration & Demonstration**

**Canine**

## Defeat

**Bomb Access & Diagnostics**

- Type of Explosive
- Device Triggers

**Render Safe**

- Electronic Countermeasures
- Inerting

**Robotics**

## Mitigate

**Blast Mitigation**

- Blast resistant materials
- Protective countermeasures
- Stabilize damaged structures
- Urban blast effects
- Predictive models

**Effective Risk Communications**

**Cross Cutting:**

Standards, Technology Demonstration/ System Integration

Outreach, Integration of Public Perception Data, Community Resilience

Information Sharing: Intelligence Data Sharing (Intel Community); Interagency Technology, Resource & Test sharing (DoJ, DoD, DoE)

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# Counter-IED Investment Areas

- Social and behavioral science to identify potential IED threats

  - Real-time, automated video-based identification of suspicious behaviors

  - Framework integrating social and behavioral science indicators of radicalization

- Strategies to prevent potential IED attacks before they occur

  - Tested, effective strategies to counter violent extremism in domestic context

**A portfolio focused on identifying and preventing potential IED threats**

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# HFD Research on Violent Extremism

**Program Goals:** Improved ability to assess and counter potential extremist violence

**Needs/Gaps:**

- Identify indicators that actors are moving toward extremist violence

- Analyze the impact of countermeasures used to prevent extremist violence and IED attacks



**Strategy/Approach:**
**Utilize multiple social and behavioral science methods to extract indicators**
**Develop and validate an integrated framework**
**Systematically assess the efficacy of countermeasures using qualitative and quantitative methods**

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# HFD Research on Violent Extremism
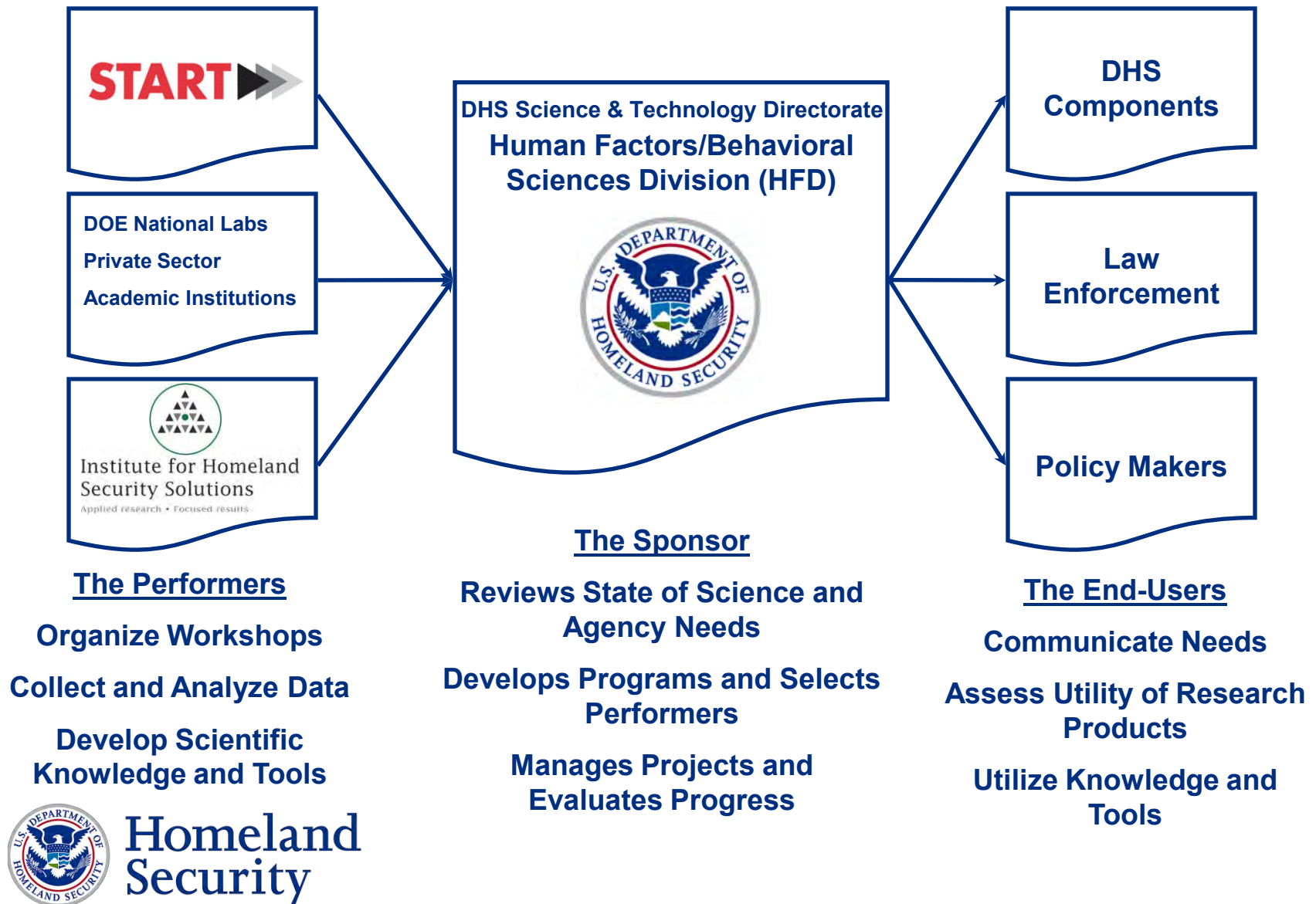
# HFD Research on Violent Extremism
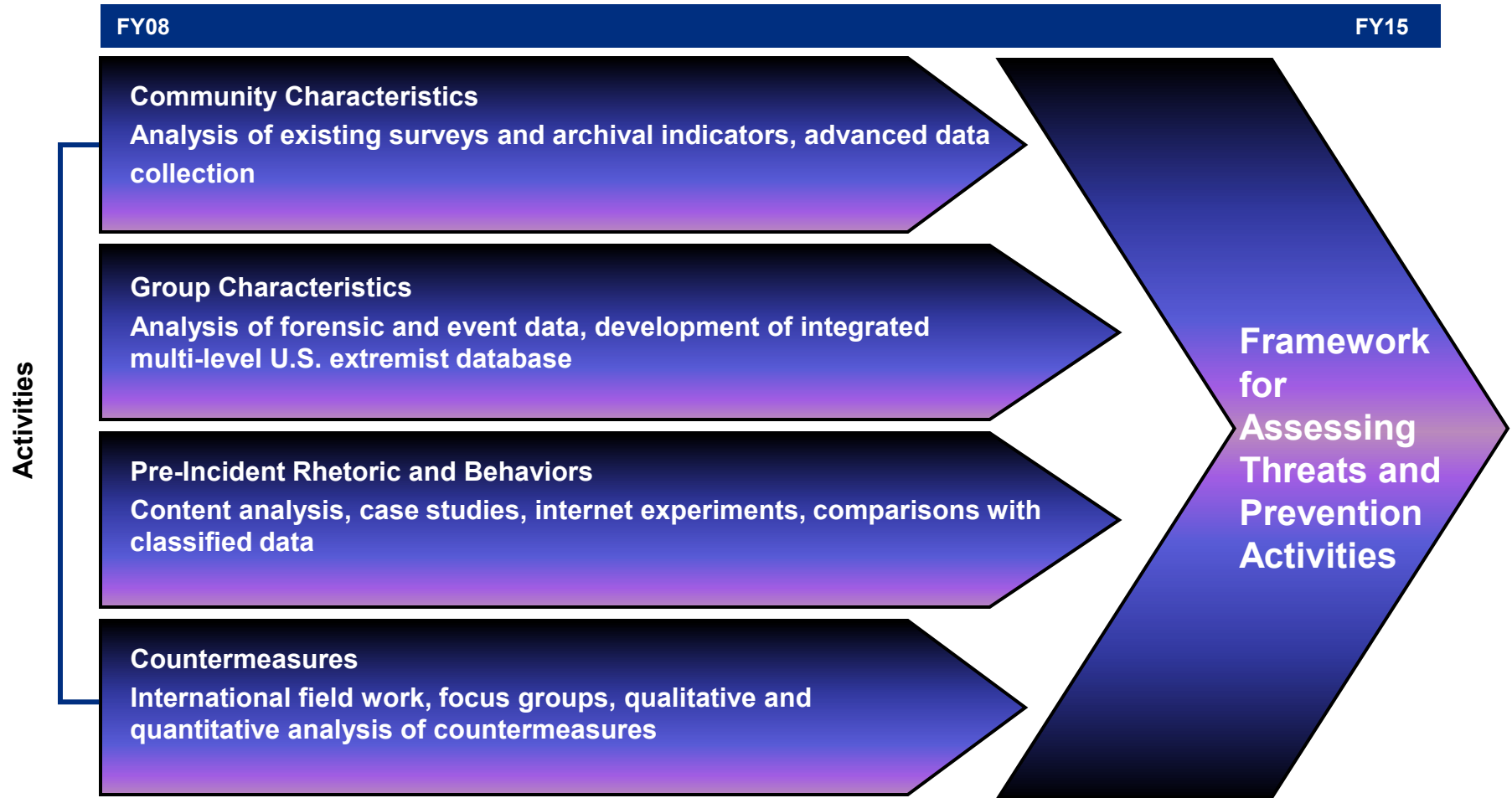
# HFD Research on Violent Extremism

**Early Activities**

• Delivered reports on

– Characteristics of IED incidents based on analysis of Global Terrorism Database (GTD)

– Existing polls of U.S. Muslims (preliminary)

– Five international ―de-radicalization" programs and the measures used to evaluate their efficacy

• Sponsored interagency workshops on

– Coding methodologies for case studies

– Community-level indicators of radicalization

– The role of the internet in radicalization

– Survey methodologies for assessing attitudes toward terrorism and counterterrorism initiatives





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# International Programs' Research on Violent Extremism
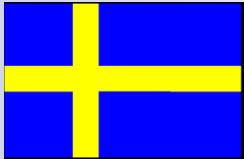
# Counter-IED Investment Areas

- Improved detection capabilities for known and emerging IED threats
  - Imaging technologies
  - Spectroscopic and trace detection technologies
- Improved probability of detection by screening for IEDs more efficiently while minimizing effect on flow of people and commerce
  - Non-contact interrogation
  - Enhanced algorithms for automation
- Improved first responders' ability to react to and defeat discovered IED threats
  - IED identification and defeat tools
  - Radio frequency jamming equipment

**Diversified investment portfolio to maximize potential for success**

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# C-IED Detect

**Program Goal:** Develop enabling technologies and operational solutions to improve customer IED threat detection capabilities

**Customers/Partners:**
- USSS, OIP, TSA, FPS, CBP, and USCG
- JIEDDO, USMC, ONR, DTRA, NIST, DNDO, NRL, NSWC-DD, and TSWG

**Needs/Gaps:**
- Detect explosive devices worn or carried by individuals (person borne threats)

- Detect explosive devices in unattended packages (leave behind threats)

- Detect explosive devices at a checkpoint concealed within stationary or slow moving vehicles (vehicle borne threats)



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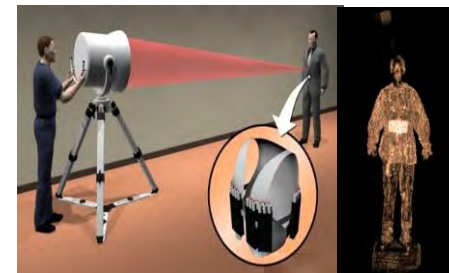
# C-IED Detect

**Strategy/Approach:**

- Perform signature characterization studies of realistic explosive threat devices: provides data for detection requirements, test standards and performance benchmarks for detector development

- Develop cueing, tracking and target selection systems: incorporates advanced hardware and software solutions into layered security architectures

- Perform system analysis, engineering and architecture design: provides analysis of alternatives, baseline systems design, and integration of component technologies

- Develop high resolution detection technology: provides advanced imaging and trace detection hardware and software with improved detection performance characteristics to address broadening threat detection requirements

- Perform laboratory and operational test and evaluation of existing and emerging security solutions: baselines existing system performance, measures advanced system capabilities and defines technology shortfalls

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# C-IED Detect

**Accomplishments:**

- Demonstrated the use of a broadband, tunable laser system to enhance stand-off threat detection capability

- Established a standoff detection test bed with interagency partners to demonstrate an integrated system approach towards explosives detection

- Initiated programs
    - to detect vehicle borne explosive devices through the use of high energy techniques
    - to detect individuals carrying or wearing explosive devices, based upon acoustic and infrared detection techniques
    - for standoff and non-contact detection of trace amounts of explosives

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# C-IED Response/Defeat

**Program Goals:** Initiate, prioritize, and execute research and development projects that meet bomb squad requirements to effectively render explosive devices safe, placing specific emphasis on technologies to access, diagnose, and defeat terrorist improvised explosive devices (IEDs)

**Customers/Partners:**
- OBP, OIP, FBI, ATF, USSS, USCG, CBP, State/Local Bomb Squads
- JIEDDO, TSWG, NIJ, FBI

**Needs/Gaps:**
- Analyze vehicles and leave behind packages utilizing Access and Diagnostic tools to determine content
- Defeat the improvised explosive devices (IEDs) containing both sensitive and insensitive explosives and enhanced payloads (includes VBIED, PBIED, WMD devices).
- Increase standoff distances, reduce collateral damage, and enhance the safety of bomb squad technicians.

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# C-IED Response/Defeat

**Strategy/Approach:**

- Develop and adapt a suite of interoperable response tools to improve and standardize bomb squad capabilities (e.g. platforms, interfaces, common architecture, standards, ECM, RF-based bomb squad technologies)

- Leverage existing robotics technology to provide advancements in stand-off and remote diagnosis and defeat

- Evolve advancements in robotic arm manipulation, while increasing power supply, decreasing overall weight, extending operational time, and improving navigation, communication, safety and operational control

- Enable detect sensors to integrate with bomb squad robotic platforms

- Conduct Test and Evaluate at the Bomb Squad test Bed (transition via the FBI's Hazardous Device School)

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# C-IED Response/Defeat

**Accomplishments:**

- Established an interagency technical requirements working group to gather future Electronic Countermeasures (ECM) technical requirements
- Established the Bomb Squad Test Bed with the Michigan State Police to perform test and evaluation on prototype equipment
- Verified the following technology at the Michigan test bed:
  - Single-Sided Imaging System to image suspect VBIEDs
  - Pneumatic Water Canon to render a suspect VBIED safe
- Drafted and delivered the Bomb Squad Strategic Plan, as well a explosive tool test data, to state and local bomb squads

**Future Direction:**

- Develop future Render Safe Tools through derivation and validation of vehicle bomb characteristics
- Continue to advance the capabilities of the current fleet of robots (e.g. employ surgical precision tools)
- Develop an intuitive diagnostics capability that can be quickly deployed when vehicle bombs are suspected
- Develop DHS-centric performance requirements for the next generation ECM systems
- Improve the Test and Evaluation and Transition processes by leveraging the Bomb Squad Test Bed and the FBI Hazardous Devices School

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# Counter-IED Investment Areas

- Enhanced blast resistance
  - Advanced blast-resistant materials
  - Models for assessing damage from blast
- Mitigation of effects
  - Rapidly deployable means to stabilize damaged structures
- Community resilience
  - Communication of clear, understandable, credible warnings in the event of an IED threat
  - Recovery in the aftermath of an attack

**Preventive measures to reduce effects of an event, help for recovery afterwards**

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# Advanced Materials Research

- Conduct basic research and testing of materials such as ultra-high performance concretes, ceramics, foams, layered composites, woven and nano-enabled materials

- Report on the current state of the art for use of advanced materials to counter IED effects

- Research UHPC/RPC to advance
  - Ultra high strength
  - Ductility, flexibility
  - Toughness, Impact resistance
  - Durability
  - Impermeability
  - Freeze/thaw, corrosion resistance
  - Abrasion resistance



Ductal ® Components

Canopies

Struts

Columns

Tie Beams



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**Novel materials may have more desirable environmental, durability, weight, aging, and cost properties.**

# Stabilization of Buildings



- **Criteria** for interpretation and dissemination of data, triage, and decision-making methods

(Near-Collapse Buildings Workshop, TEEX April 28-29th, 2010)

- *First Responders Search and Rescue Issues*

(Monitoring and Sensing Workshop, Oxford, MS April 6-7th,  2010)

  – Identify sensor technology to allow effective monitoring

  – Identify user-friendly technology that will not hinder the mission of first responders

  – Facility reconciliation of field data with analytical models

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Science and Technology

# Bridge Vulnerability



**PROJECT DESCRIPTION**

- Study the vulnerability of steel plates, girders, and cables to terrorist threats, particularly explosives, and updating computational models based on the results.
- Specimens to evaluate vintage bridges will be taken from
  - Golden Gate Bridge (CA)
  - Crowne Point Bridge (NY) and
  - Williamsburg Bridge (NYC)

  as they are being refurbished or demolished in order to evaluate IED effects on vintage bridges.

**Impact**

- Provides vulnerability information for bridge components subjected to aging, wear, and weathering
- Data can be used to validate and improve numerical models that predict failure for bridges subjected to explosives
- Understanding failure mechanisms for bridge components enables more effective design of protective countermeasures

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Capitalizing on existing assets provides data on effects of real-world aging on material properties

# Improved Numerical Modeling of Soils

## The Problem
- Existing numerical &constitutive models for blast effects in soils do not match the test results
- Current estimates are
  - based limited data sets
  - have insufficient information about soil damage
  - unable to evaluate the integrity and condition of remaining material

**Original embankment**  **Numerical model prediction**

**Soil damage area**  **Actual resulting crater**

**Typical result for blast experiment on an embankment dam**
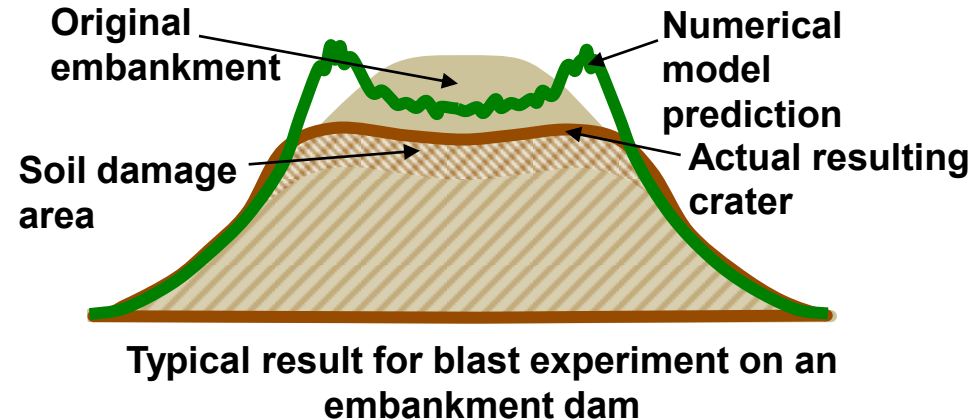
## Our Approach
- Conduct physical tests and numerical simulations to determine the shortfalls of current models and how they can be improved
- Improve on current physics based, 1st principle approaches to modeling soils subjected to blast and seismic loads

## Impact
- Accurate models will reduce the need to conduct extensive and expensive physical tests to address new threat scenarios.

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# Community Perceptions of Technology Panels

- A formal process
  - to understand and incorporate community perceptions of critical technologies within the US.
  - to maintain the balance between security and personal privacy/civil rights and liberties

- Provides DHS agencies and Program Managers with insight <u>prior to development and deployment of technology</u>.
  - potential reactions
  - issues
  - obstacles to a technology

- Engages the public, making them active stakeholders in the research and development of critical technologies.

Homeland Security

# Community Perspectives into Technology Development: Challenges and Issues

- Civil Rights, Civil Liberties
- Privacy, Intrusiveness and Invasiveness
- Privacy of information
- Convenience and Comfort
- Perception of Threat
- Location
- Cost
- Complexity, usability
- Safety
- Tradeoff value

Homeland Security

# Incorporating Community Perspectives into Technology Development



- **CPT Panels 2008**

- Microwave Vehicle Stopping

- Raman Spectroscopy- IED Standoff Explosive Detection

- Mobile Biometrics

- Nonlinear Acoustic IED Standoff Threat Detection

- **CPT Panels 2009**

- Northern Border Technology - RFID Registration and Low Resolution Imaging (Joint panel with Canada)

- Standoff Threat Detection- Imaging Systems
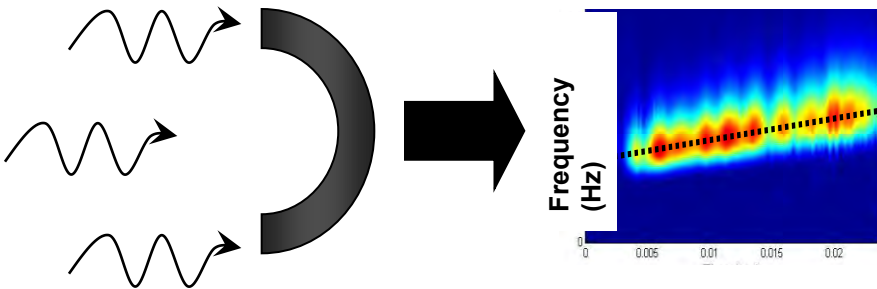
Homeland Security

# Homeland Security S&T Enterprise



Rev 07-23-09    32
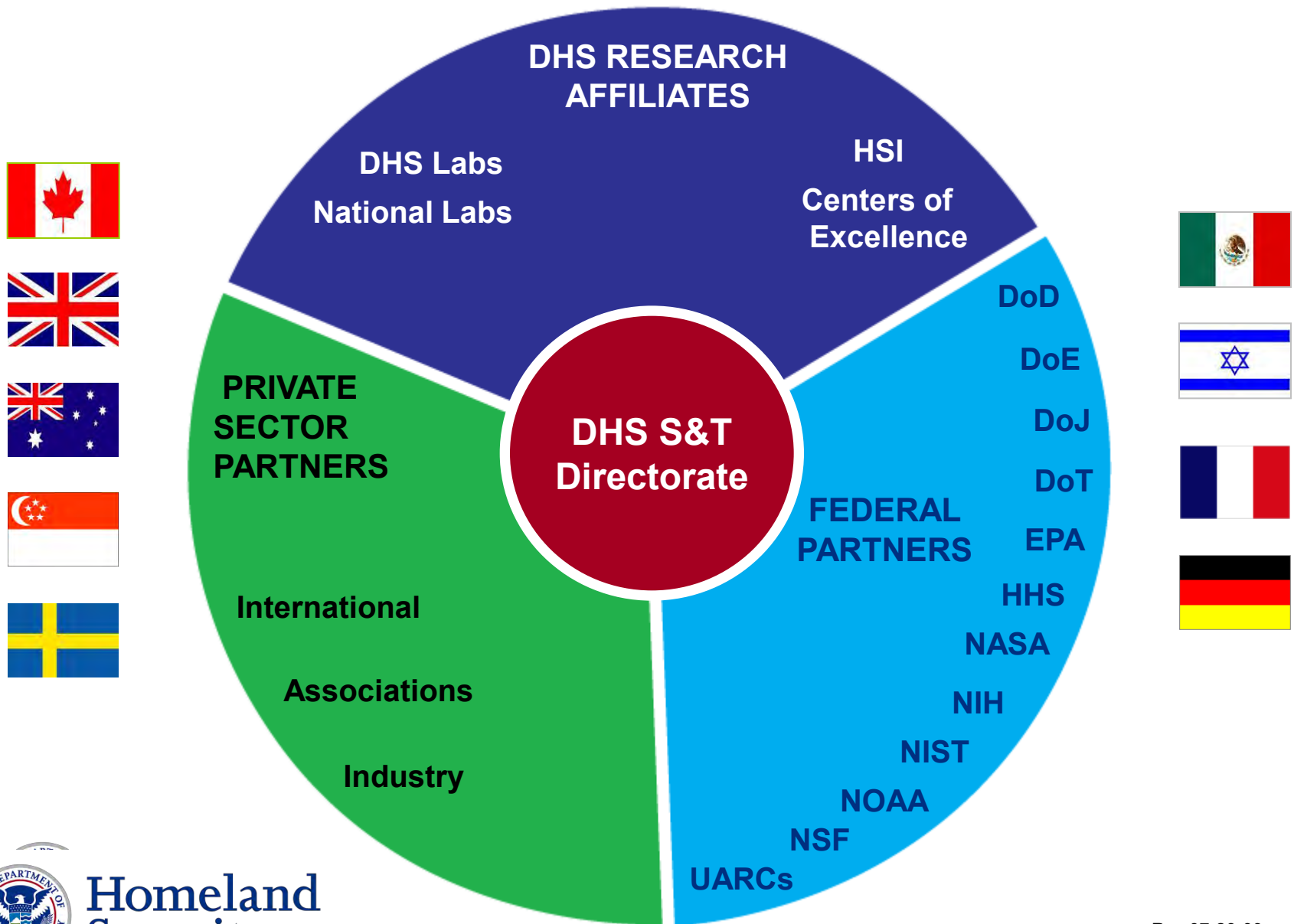
# Summary

- The domestic threat is real; preparation is vital
- To protect our people in a free and open society, we must get ahead of the terrorists
  - Counter violent extremism/radicalization
  - Prepare people and infrastructure
- Cooperation makes us stronger
  - Domestic
  - International

Homeland Security

# Contact Information

- PEO, C-IED: SandT.cied@dhs.gov

- Broad Agency Announcements Solicitation Topics
  - Long Range BAA – addresses needs of 6 S&T divisions
  - *For more about BAAs, visit* ***www.FedBizOpps.gov** *and* https://baa.st.dhs.gov

- NSTC Domestic IED Subcommittee report, *Research Challenges in Combating Terrorist Use of Explosives in the United States*:

http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc-domestic-ied-2008.pdf

**Homeland Security**

# What is "terrorism"?

- Title 18 USC Section 2331, (5)
  - (5) the term —domestic terrorism" means activities that—
  - (A) involve acts dangerous to human life that are a violation of the criminal laws of the United States or of any State;
  - (B) appear to be <u>intended</u>—
  - (i) to intimidate or coerce a civilian population;
  - (ii) to influence the policy of a government by intimidation or coercion; or
  - (iii) to affect the conduct of a government by mass destruction, assassination, or kidnapping; and
  - (C) occur primarily within the territorial jurisdiction of the United States.

Homeland Security

# EXPLOSIVE ORDNANCE DISPOSAL DIRECTORATE BRIEF

**SGM Frey**

- Develop, integrate, and synchronize Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, & Facilities (DOTMLPF-RIO) requirements for Explosive Ordnance Disposal (EOD) throughout TRADOC and coordinate Joint, Interagency, Intergovernment, and Multinational (JIIM) EOD requirements in coordination with SCOE and DA G3/5/7.

28 Required
20 Available (7 mil, 3 GS, 10   Contractors)

*Concept plan end state is 28 Auth*

EOD Director's Office

*"Provide a single focal point for all EOD issues within TRADOC – a critical need according to the DA G3/5/7"*
**Concept paper, p.3**

Training Division

Doctrine and Capabilities Development Division
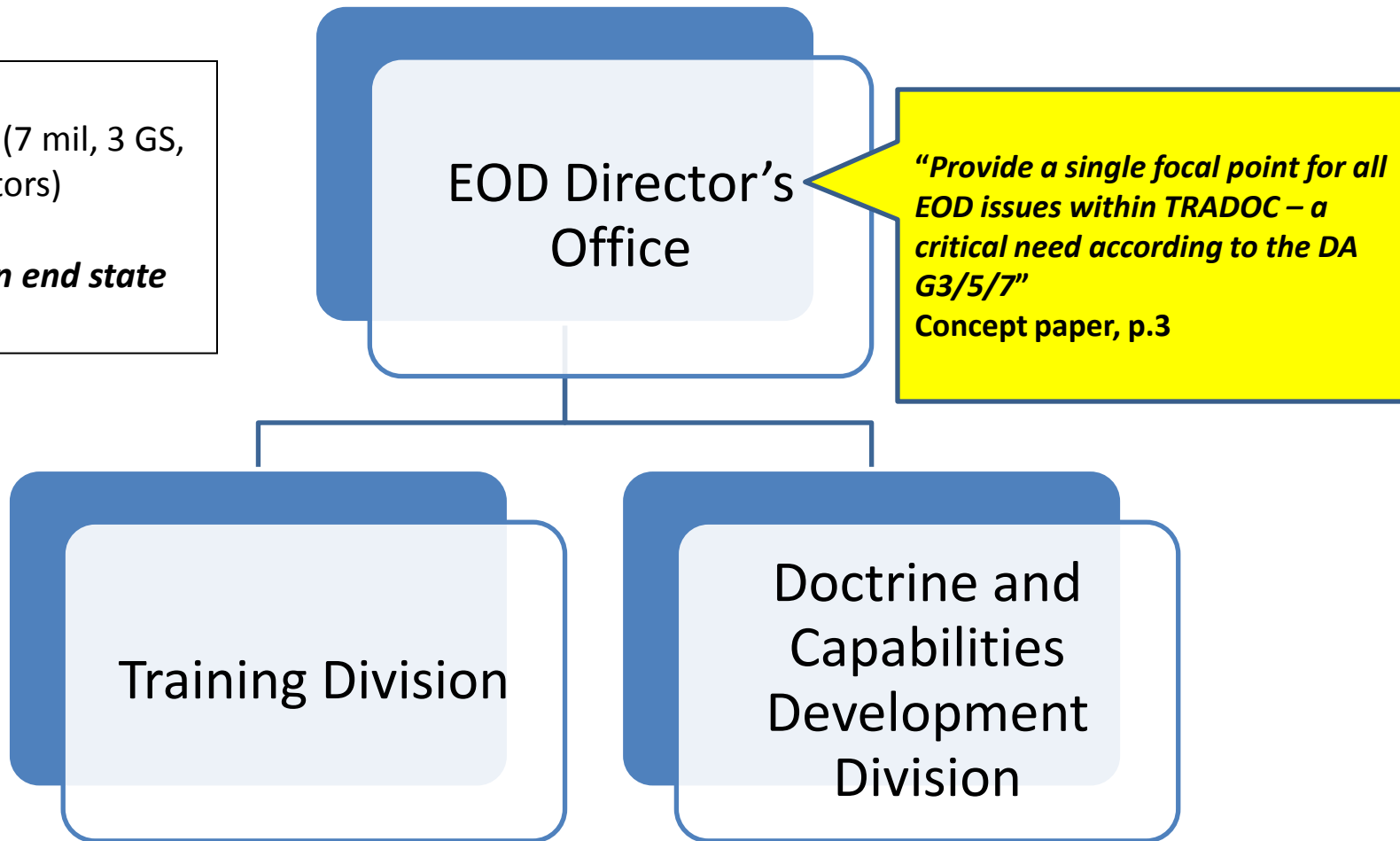
# EOD DIRECTORATE MISSION

*"The EOD Directorate will be stood up on 1 October 2009 with limited operational capability .The goal is for the Directorate to achieve full operational capability by 1 Oct 2010." (Concept paper)*

**"You are here"**

| Separate CASCOM EOD Elements | → | EOD Directorate | → | EOD COE |
|---|---|---|---|---|

(IOC) 1 Oct FY10
(FOC) 1 Oct FY11

"Established" FY 13
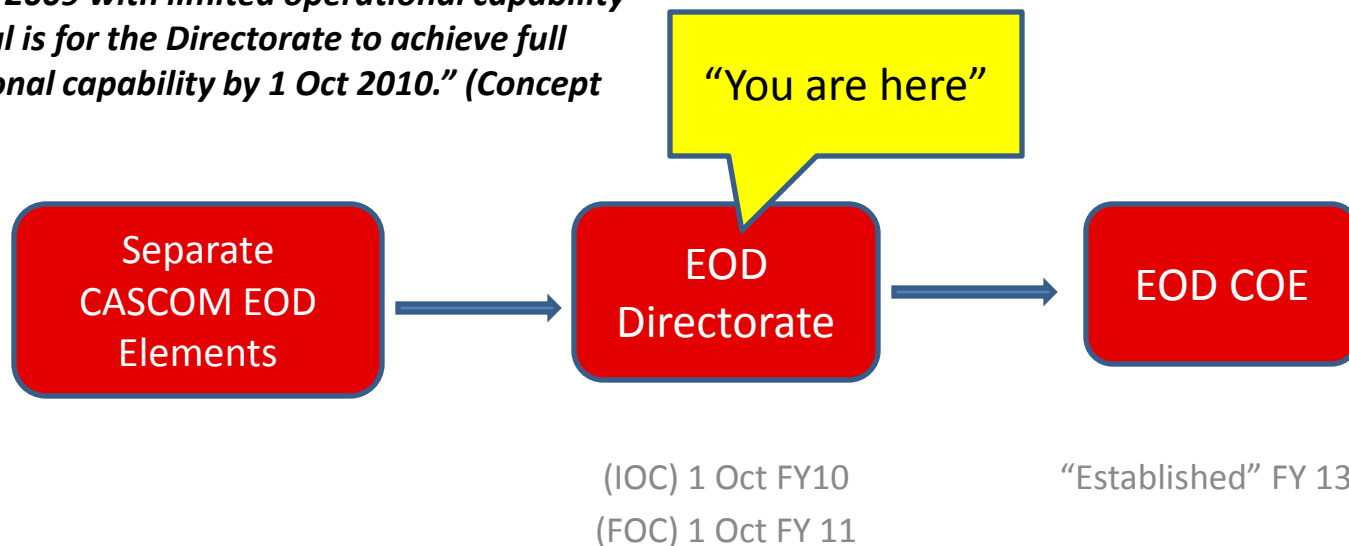
- Bldg 10200 occupied by Mar 2010
- Concept paper at CASCOM TRADOC  (informal adjudication of G-8, ARCIC comments)
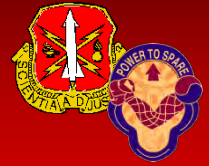
| | CURRENT | FUTURE |
|---|---|---|
| DOCTRINE | • FMI 4-30.50 (Army EOD Ops)<br>• FM 4-30.51 / MCRP 3-17.2A (UXO Procedures)<br>• FM 4-30.16 (MTTP for EOD in Joint OE) | • FMI 4-30.50 rewrite and conversion to ATTP 4-32<br>• Merger of Army and Marine Corps only manual in MTTP<br>• Rewrite of MTTP for update of Joint TTPs<br>• Participate in FM 4-3 (Ordnance Ops) pub<br>• ATTP 5-0.1 (EOD Appendix) |
| CONCEPTS | • Core participation in Site Exploitation (SE), Weapons Technical Intelligence (WTI) and Weapons Intelligence Team (WIT) development projects | • 2010 Army Operating Concept<br>• 2010 Army Functional Concept for Sustain<br>• 2010 Army Functional Concept for Protect |
| ORGANIZATION | • Transformation of Legacy EOD structure to Modular (FDU 05-02)<br>• Begin BRAC restationing to projection platforms | • Complete Modular transformation (through FY 15)<br>• Complete BRAC restationing |
| TRAINING | • 89E Course<br>• 89D ALC, SLC<br>• Advanced IED Defeat (AIED-D)<br>• Gator Transformation (JATAC)<br>• Tactical Post Blast Course<br>• EOCA<br>• DL Modules | • 89E Course<br>• 89D ALC, SLC<br>• Advanced IED Defeat (AIED-D)<br>• Gator Transformation (JATAC)<br>• Tactical Post Blast Course<br>• EOCA<br>• DL Modules |

|  | CURRENT | FUTURE |
|---|---|---|
| MATERIAL | • Future Radiographic System (FRS)<br>• Decision Support System (DSS)<br>• Advanced EOD Robotic System (AEODRS)<br>• MMPV-Panther<br>• AN/PDX-2 Radiac Sets<br>• MK 1 MOD 0 and MK 2 MOD 0 (CIP)<br>• AN/PLT-4 CREW<br>• AN/PLT-5 Man Portable CREW | • Blast Overpressure Tool (Maxi Candle)<br>•  High Fidelity WMD Identification<br>• Electronic Safe and Armed  (ESAF)<br>• Next Generation Advanced Bomb Suit<br>• Light Weight Multifunctional Disrupter |
| LDR DEVELOPMENT | • 89E Course<br>• 89D ALC, SLC<br>• Advanced IED Defeat (AIED-D)<br>• Gator Transformation (JATAC)<br>• Tactical Post Blast Course<br>• EOCA<br>• DL Modules | • 89E Course<br>• 89D ALC, SLC<br>• Advanced IED Defeat (AIED-D)<br>• Gator Transformation (JATAC)<br>• Tactical Post Blast Course<br>• EOCA<br>• DL Modules |
| PERSONNEL | • AIP<br>• CSRB, SRB<br>• Career Pay<br>• Attrition at School House<br>• Enduring Recruiting Program<br>• EOD Plans/Positions with BCT/DIV/CORP<br>• Prerequisites<br>• OD Website EOD inject | • Maintain Throughput at school house<br>• Maintain Plans positions within DIV and CORPs staffs<br>• Maintains plans and ops liaison personnel within BCT |
| FACILITIES | • Restationing Packet for EOD Directorate<br>• Student Load exceeding capacity of NAVSCHOLED | • Continuously monitor restationing Package<br>• MILCON projects to increase Lodging and classroom facilities |
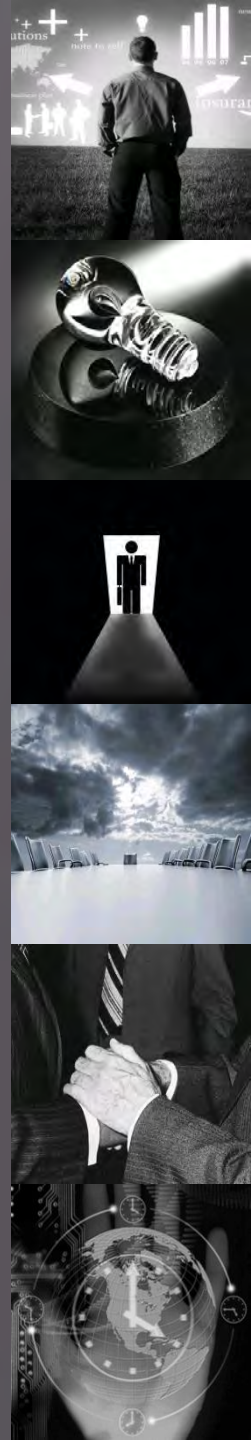
# Outline

- Introduction
- What is Irregular Warfare?
- How do we address Irregular Warfare?
- What are the implications for the Future?
- Conclusion

**War is a chameleon**

# Definitions

- References: JOC 2007;JOE 2008; CCJO 2009

- IW= Population Focus v. CW =Military Focus

- COIN, UW, CT, FID, SSTR

- Supporting Activities: IO, Psyops, Strategic Communication, CMO, Law Enforcement Against Transnational Crime….

- Simultaneous with Conventional Warfare or independent

- Definitely not Irregular and often not War

--Cigarette Smuggling in Mali?

# Cause

- Total War Paradigm- Mechanism is….

- Strategic Problem is a balance of Capacity, Demand and Time to achieve a solution

- Faction without Capacity changes time and Demand parameters

*Mines are the poor man's tank*

# A Conflict Sine Wave

- Spectrum of Conflict (High, Medium, and Low Intensity= Amplitude)

- Phases of Conflict (Strategic Engagement, Initial Entry, Build up, Decisive Combat Operations, Stability and Reconstruction, Transition= Frequency)

- Conflict is Persistent and Dynamic– Mao's Protracted Warfare

  ◦ - Resource Competition; Trans-National Crime; Population Migration; Clashes of Perception

**Policy is War by another Means-
A corollary**

# A Human Problem

- Information Age Warfare- Alberts et al.
- OODA Loop- Col. John Boyd, USAF
- Emotional Decision Making
- Understanding Intent and Perception/ Apperception—Somalia Story

- Red Teaming (UFMCS)
- Dynamic Social Network Analysis

(CADS/ MIT Program)

# The Counter-Threat Cycle

- Deter
- Detect
- Prevent
- Protect
- Remediate
- Recover

- Requires a System of Systems approach, dynamic and persistent.

# Strategic Evolution

- Combined Arms
- Joint
- International
- Inter-Agency
- Comprehensive

Making the Suit Fit the Fight

— "We do not draw our boundaries where you draw yours"- USC Representative 1993, Near Baidoa, Somalia

# Conclusion

- ―Iregular Warfare" has always existed and always will

- Managing perception (ours and theirs) is the critical element

- Capacity- Demand- Time Analysis= Get a better fitting suit or change the requirement to wear one

# Questions

- So Why Should I Care?

# Legal Information

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# *Multi-National Corps Iraq*

## *TF TROY Counter IED Update*
## *NDIA Global EOD Conference*
### *COL Patrick Kelly*

# Points of Emphasis

- *Criticality of forensics process, specifically biometric match attribution; transfer of capability to ISF while also affecting a paradigm shift in Iraqi Rule of Law*

- *Balancing shift in focus towards ISF Parternship and Transition while maintaining CF support as critical enabler*

- *Ensuring access to significant IED and cache events to maximize awareness of emerging threats and enable ISF to conduct C-IED and Technical Intelligence operations*

- *Mentoring key leaders to develop a cross-ministerial strategy (MOD / MOI / MOJ) to realize a proactive, left of boom C-IED process within the Gov't of Iraq*

# *CJTF Troy Mission Statement*

CJTF Troy exercises command and control of specialized Joint Counter-IED and CBRNE forces to neutralize the CBRNE/IED threat; conducts weapons technical intelligence collection and exploitation to defeat IED networks;

**assists ISF** in building sustainable security capabilities.

## Assigned Specialized C-IED forces include:

Explosive Ordnance Disposal (EOD)

**ISF Partnering & Transition LOO cut across all LOOs as Coalition Forces continue the drawdown**

Technical Escort (CBRN/CRT)

Targeteers (CITP)

# CJTF Troy - Core Capabilities


EOD/IED Defeat


Chemical/Biological


Weapons Technical Intelligence


Transfer of C-IED Capability




IED Tech Intel / Forensics


C-IED Equipment


Training


IED Intelligence Products

# Counter IED Process



1 - Exploit the Scene

2 - Exploit the Device

3 - Identify the Bomb-maker

4 - Identify Cells

5 - Identify The Network
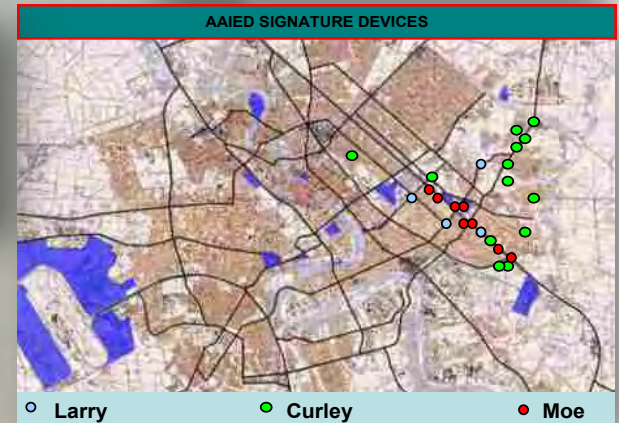
6 - Disseminate Actionable Intelligence
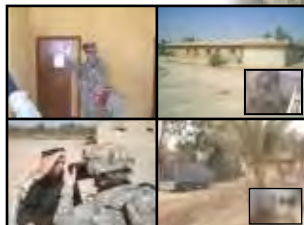
7 – Support to Judicial Process

8- Disseminate new TTPs

AAIED SIGNATURE DEVICES

Larry      Curley      Moe

FINGERPRINT CHART

UNCLASSIFIED

# Transitioning the C-IED Process
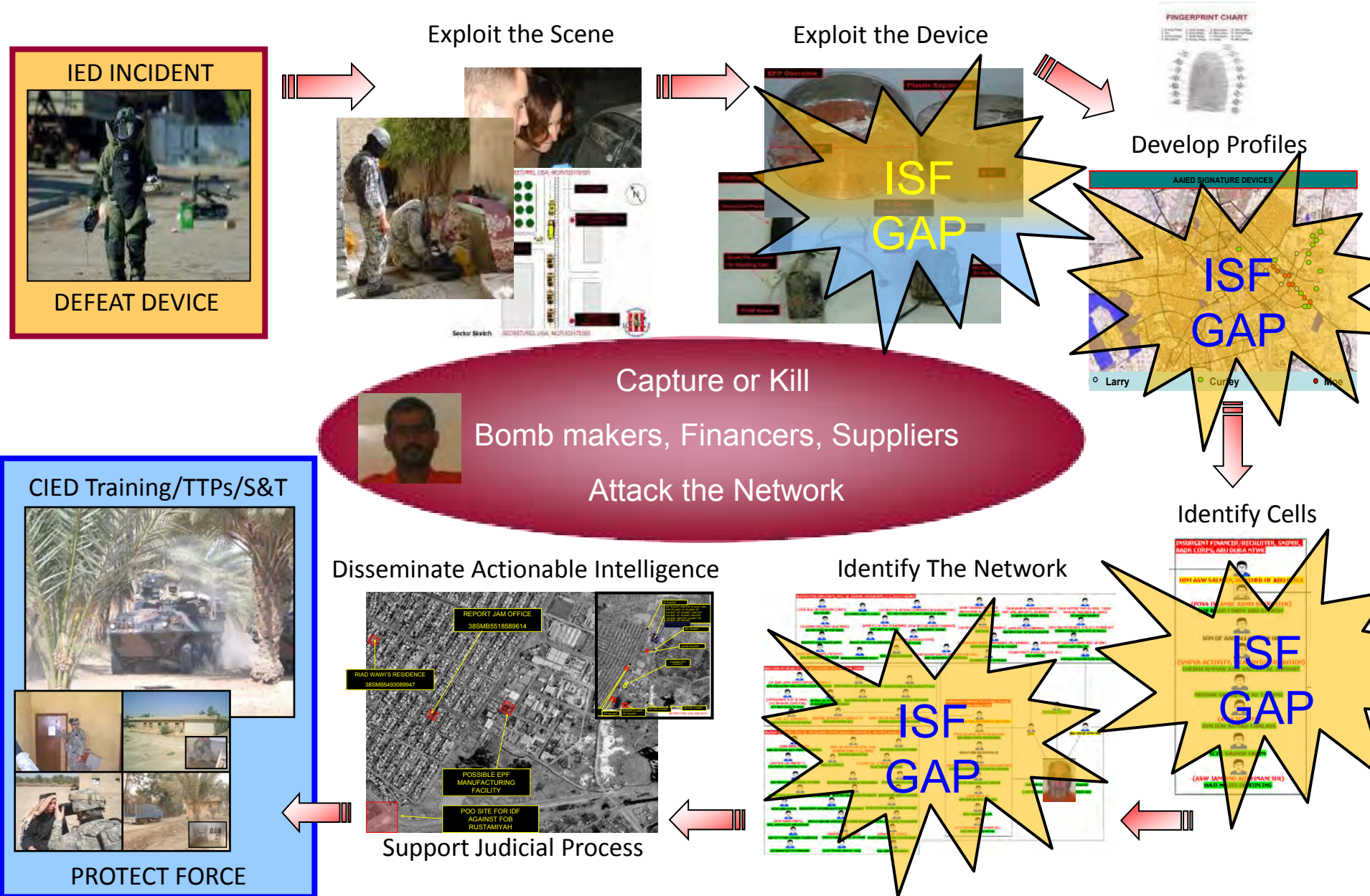
# Iraqi Explosives Exploitation Initiatives



- **Combined Joint Explosives Triage (CJET)**
- **Explosives eXploitation Iraq Transition (EXIT)**



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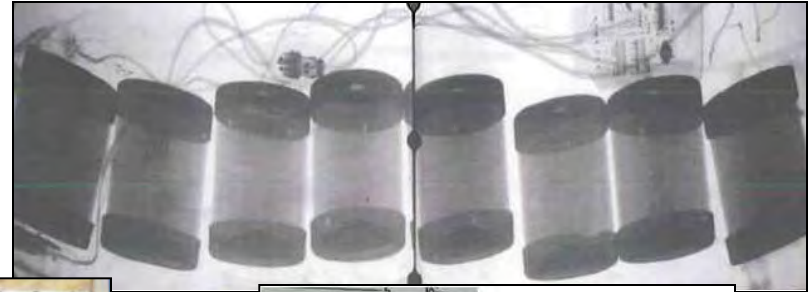
# Explosives Exploitation Partnership

**Goal:** *Create an Iraq-led, combined, organic, sustainable, explosives exploitation capability, partnering and sharing information with CF, to defeat a common enemy*

- *Initial stage:  Combined Joint Explosives Triage (CJET) – late 2009*
  - *3 Iraqi Police, 3 Iraqi Army EOD Techs in a 45- day Triage apprenticeship program*

- *Follow-on stage:  Explosives eXploitation Iraq Transition (EXIT) – early 2010*
  - *Follow-on training in post-blast , biometrics and chemical exploitation; UK FCO lead*

- *Desire End State:  2-3 Iraqi explosives exploitation labs established and sustained by new cadre of Iraqi explosives exploitation specialists*

**Site Exploitation**

**Triage**
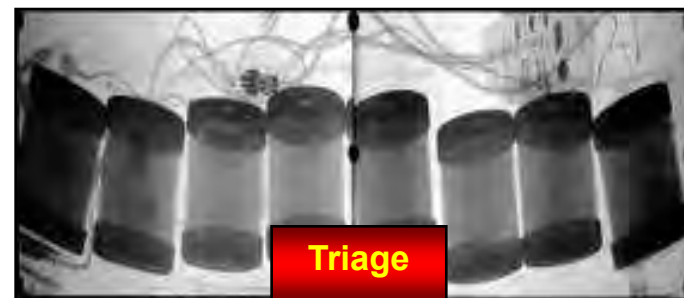
# Warrant Packages / Testimonial Support

- *Sovereign country with end of UN Security Council Resolution and elections*

- *Changes in unilateral operations; Adherence to US / GOI Security Agreements*
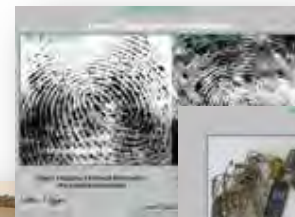
# *Partnership and Transition*

# *Tactical Level Engagement*



*17th IA Division Engineer Regiment*

*Combined Disposal Operation*

*Iraqi planned and led*

*15 July 2009*



*WIT 2 instructing Mosul IP CET forensics and SSE 11 Jul 2009*

*WIT 11 teaching Kirkuk IP CET computer based reporting training*

# Operational Level Engagement

## JTF-Troy MND-B Baghdad ISF EOD Commander's Conference

### Al Faw Palace – Summer 2009

# *Strategic Level Engagements*

# Ministry of Justice Strategic Engagement

# Information Sharing Cycle with ISF



**Evidence redistributed to ISF to complete cycle**

**Evidence is provided by MOI, MOD EOD forces**

**Incident storyboard created by CF EOD**

Insurgents prosecuted in Iraqi Courts under Rule of Law

**Evidence is processed and exploited by TROY CEXC**

**All products/processes translated into Arabic**

# Key Points

- **Iraqi C-IED capability is critical to the security of Iraq**
  - *GOI support is critical, for the good of Iraq*
    - *Coalition can help fill gaps, as Iraq develops, executes strategy*
    - *Sharing & cooperation between CF and ISF is essential as CF departs Iraq*

- **Must have coordinated strategic end state (C-IED, forensics, labs)**
  - *Cooperation between MOI & MOD entities is crucial to effective C-IED strategy*
    - *Pool resources, plan together, work together, protect Iraq together*

- **Unity of effort, open lines of communication very important**
  - *Must build effective command and control for EOD, investigations, and exploitation*

- **Iraq must develop effective C-IED capabilities**
  - *Defeat the network before the explosions occur*
    - *Site exploitation, reporting, fusion, analysis = defeat the enemy network*

*Coalition support to Iraqi-led operations saves Iraqi & Coalition lives – teamwork & cooperation defeats common enemy*

# *ISF & Coalition Cooperation*

- **Coalition will respect Iraqi sovereignty & Security Agreement**
- **Coalition encourages the IGFC to:**
  - **Promote scene access and evidence sharing with CF EOD**
  - **Continue to grant access to key IED evidence:**
    - **Post Blast scenes; IED and IED-related material**
    - **Weapons Cache sites with explosives**
    - **Strikes against coalition**
- **Every IED event is a crime scene – evidence vital to defeating network**
  - **Partner with Coalition to prosecute common enemy**
  - **Ensure Iraqi Army preserves evidence**
- **Coalition will share information derived from the turn of evidence by the Iraqi Security Forces**
  - **Tech reports, Intel reports, Safety Notices, Warrant Packages**
  - **Reports are available in Arabic through Coalition partners**

*Coalition support to Iraqi-led operations saves Iraqi and Coalition lives – teamwork defeats common enemy*

# United Kingdom / Australia End of Mission

# Questions / Comments

# LTG Hertling Red Team
# 6-9 Apr 10, Eglin AFB

LTC Jeff LaCaze

EOD Directorate

Ordnance Center and School

# Agenda

- BLUF
- LTG Hertling guidance
- Findings / Targets of Opportunity /Recommendations

### "The challenge"
•*Requirements have nearly tripled from 1204 authorizations to 3416.*
•*School throughput is 5x what it was in 2003 (from 210 to 1075).*
•*Attrition rate has once again doubled to 40%.*



Army NAVSCOLEOD Historical Attrition Rate %
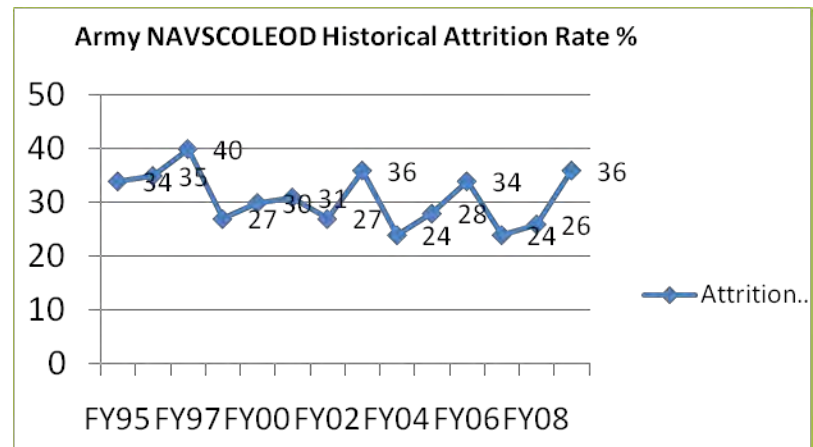
# BLUF

- *We think we can do better...There are ways to maximize graduation #s and reduce attrition.*

- *We see an opportunity to reduce Army Attrition rates up to 10% by mid CY 11.*

- *Target attrition rate 30%.*

# LTG Hertling Guidance

"Holistic" solutions

No recommendation off the board!

- **LTG Hertling VTC comments:**
  - **1. Look at what we are not doing to prepare soldiers for entering EOD school**
  - **2. Create a feeling that they are a "select group"**
  - **3. Prepare them mentally, physically, and technically to successfully complete the course. Tell them what is expected**
  - **4. What personnel policies are in place setting soldiers up for failure**
  - **5. Look at discipline attrition at Eglin, Why?**
  - **6. Look at differences in attrition in phase I and phase II per service**
  - **7. "Gaming" applications need to be made available.**
  - **8. Inform the Navy CAPT that the Army is taking this seriously.**

*Change the nature of EOD phase 1*

| Currently primarily academics "train the test" | → | PT heavy<br>Motivational<br>Team-building<br>How vs What to think |
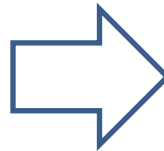
# EOD Personnel Pipeline

Max # of graduates

TDY status

PCS status

| Recruiting / Assessing | → | Redstone / PH1 EOD | → | Eglin / PH2 EOD | → |
|---|---|---|---|---|---|

attrition
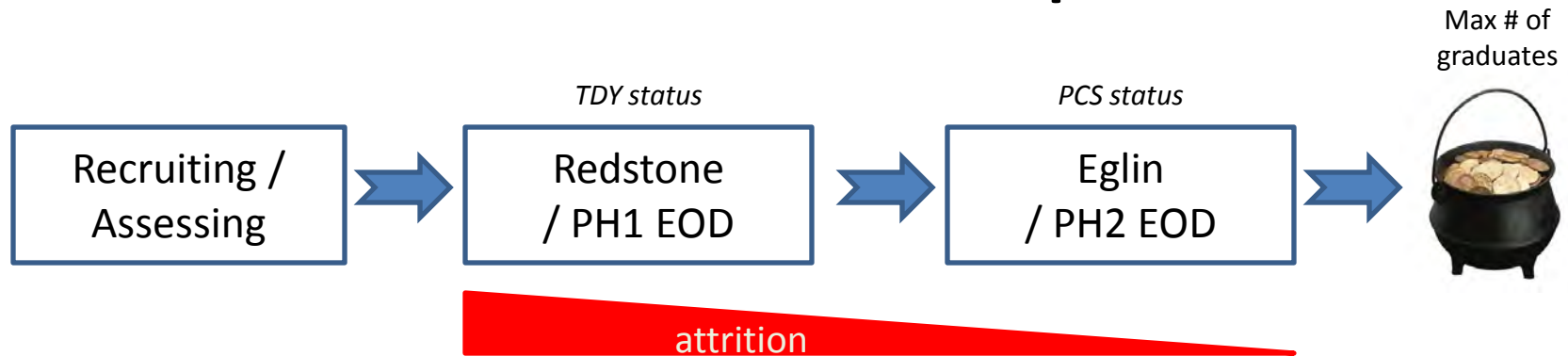
## Current Targets of Opportunity / Recommendations

Data feedback loop

### Recruiting / Assessing

1. Change General Maintenance (GM) 105 to Skilled Technical (ST) 110
2. Other eligibility criteria changes
   a) Eliminate Time-in-grade (TIG) waivers for SGTs
   b) Remove 2 year active duty requirement
3. In Service Recruiting (ISR) Organization becomes an enduring capability
4. Bombs suit test standardization
5. Block Recruiting Operations Center (ROC) waivers
6. Basic Training at same location
7. Alter Prior Service eligibility
8. Continue to "OverTRAP"
9. Officer Accessions changes
10. New Recruiting Video

### Redstone / PH1 EOD

1. Incorporating performance psychology
2. PRT program re-vamp
3. Change in APFT standard?
4. Insert team building exercises
5. Exchange Test Administrator Guides
6. Realignment of EOD training assets
7. Reinstate filters
8. Seats VS Attrition guidance
9. "Gaming" Enablers

### Eglin/ PH2 EOD

1. Address inactive population
2. Medical standards adjudication (PB Board 30 Apr)
3. CSL BN CMD team
4. Success tied to privileges
5. Retrain Recycles

Continued involvement with Dr Schneider may yield long term dividends

# Global Explosive Ordnance Disposal
## Road to War Lessons Learned

*Colonel Tom Langowski*

*52d EOD Group*

*April 30, 2010*

# Counter-IED Fight

**Means** → **Ways** → **Ends**

**Company**  **Battalion**  **Group**

- EOD Teams/RCP
- CEXC/JEFF/DTK
- COIC-A
- CITP
- LEP
- JET
- EWO
- CREW
- ORSA

**Defeat the Device**

**Attack IED Networks**

**Train CF and Host Nation Security Forces (ops, planning, assessment)**

*Reduction in effective IED attacks*

*Defeat effective IED Cells*

*Reduction in IED activity*

*Reduction in Casualties*

*Gain Popular Support*

*Freedom of Action*

**Develop the premier combined, joint, and interagency capability to counter the influence of improvised explosive devices and networks. Enable the migration of Counter-IED capabilities and capacity to all coalition forces and host nation security forces in order to protect the people from insurgent attacks and free them from future threats posed by violent extremist networks.**

# BCT/EOD Company Fight

**Means** → **Ways** → **Ends**

**Company**   **Battalion**   **Group**

- EOD Teams/RCP
- CEXC/JEFF/DTK
- COIC-A
- CITP
- LEP
- JET
- EWO
- CREW
- ORSA

**Defeat the Device**

**Attack IED Networks**

**Train CF and Host Nation Security Forces (ops, planning, assessment)**

*Reduction in effective IED attacks*

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*Reduction in Casualties*

*Gain Popular Support*

*Freedom of Action*
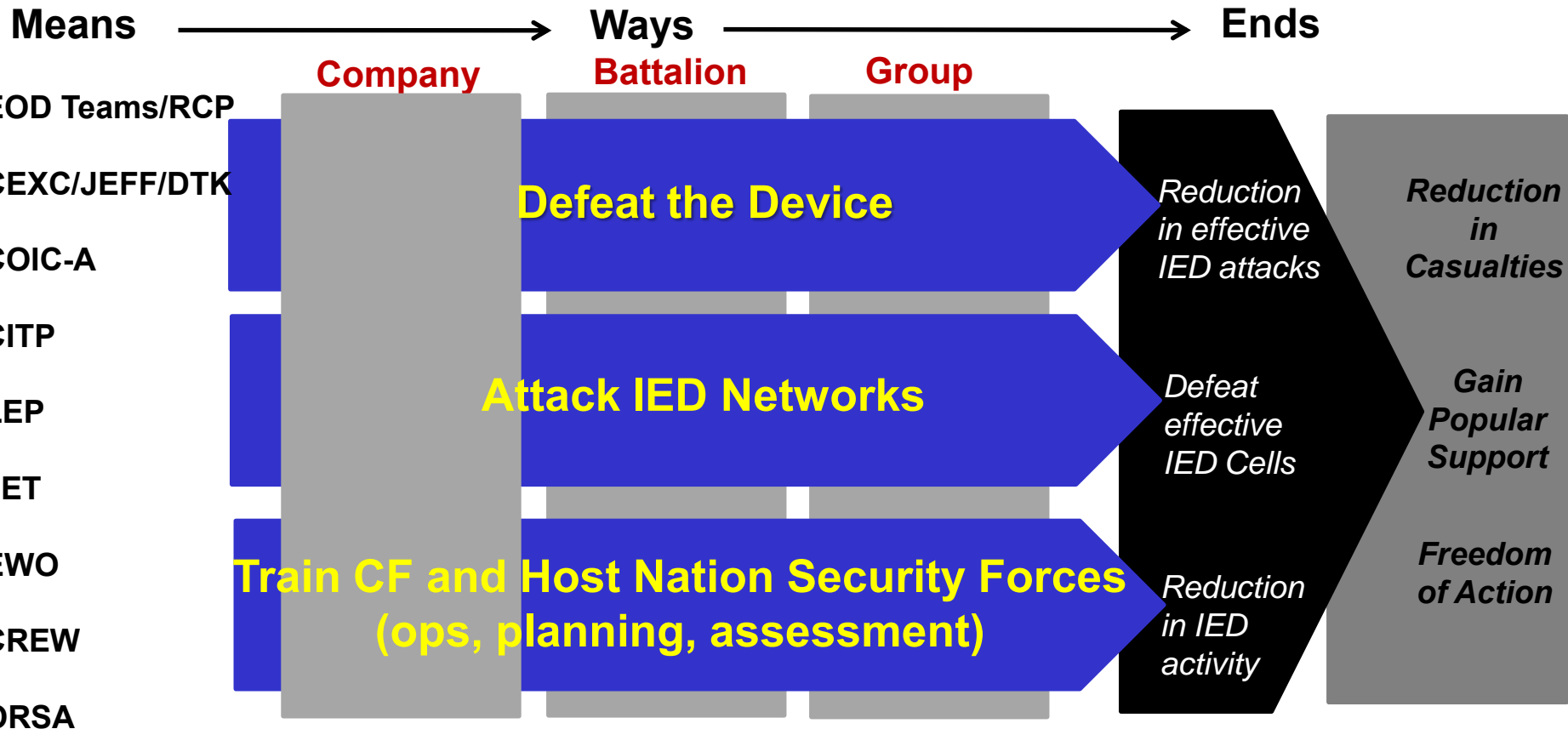
- All exploitation and intelligence collected on an IED event begins with defeating the device; EOD core competencies need to maintain that capability
- To effectively begin attacking the network requires the integration of all the MEANS available; the EOD Company leadership is often times that SME at the BCT
- Training the force requires a thorough working knowledge of red and blue TTPs

*DEFUSING DANGER*

# Division/EOD Battalion Fight

**Means** → **Ways** → **Ends**

**Company**  **Battalion**  **Group**

- EOD Teams/RCP
- CEXC/JEFF/DTK
- COIC-A
- CITP
- LEP
- JET
- EWO
- CREW
- ORSA

**Defeat the Device**

**Attack IED Networks**

**Train CF and Host Nation Security Forces (ops, planning, assessment)**

*Reduction in effective IED attacks*

*Defeat effective IED Cells*

*Reduction in IED activity*

*Reduction in Casualties*

*Gain Popular Support*

*Freedom of Action*

- Plan and employ the intelligence cycle to defeat the IED system
- Fuse exploitation products with other intelligence sources
- Analyze adversary IED Tactics, Techniques, and Procedures (TTPs)
- Analyze and recommend Electronic Warfare operations against the IED system
- Conduct mission planning in an IED environment

# Corps/EOD Group Fight

**Means** ⟶ **Ways** ⟶ **Ends**

| | Company | Battalion | Group | | |
|---|---|---|---|---|---|

- EOD Teams/RCP
- CEXC/JEFF/DTK
- COIC-A
- CITP
- LEP
- JET
- EWO
- CREW
- ORSA

**Defeat the Device**

**Attack IED Networks**

**Train CF and Host Nation Security Forces (ops, planning, assessment)**

*Reduction in effective IED attacks*

*Defeat effective IED Cells*

*Reduction in IED activity*

*Reduction in Casualties*

*Gain Popular Support*

*Freedom of Action*

- Integrate C-IED enablers and capabilities in the Afghanistan Theater
- Plan and employ the intelligence cycle to defeat the IED system
- Fuse exploitation products with other intelligence sources
- Identify and analyze enemy and friendly IED TTP patterns and protect the force
- Conduct analytical exploitation of IED events and provide timely feedback

The EOD Memorial
FOUNDATION

# The Mission

- **with admiration**, recognize, support, and appropriately honor members of the EOD family that have been killed while performing their assigned duties.

- **with compassion**, recognize, honor, and support the family members of our fallen EOD Warriors.

- **with enthusiasm and pride**, strive to increase the awareness, appreciation, and professionalism of the EOD vocation.

# Moving Forward

- **with enthusiasm and pride**, strive to increase the awareness, appreciation, and professionalism of the EOD vocation.

➤ Shift to a more proactive and "outreach" oriented mindset

➤ Continue to recruit high level Board of Directors,  Advisors, Committee leadership/members, and volunteer support

➤ Incorporate an efficient communication process to the EOD,  DoD,  Non-DoD, and lay communities

# Moving Forward

**Awareness:**

➤ Aggressive promotion of the profession

➤ National level outreach and availability to media and other PR resources

➤ Brand development

➤ Involve affinity associations for public presentations and fund raisers

# Moving Forwad



**Appreciation**:

➢ Recruit and develop a Legacy Committee

➢ Incorporate support ideas and programs based upon Legacy input

➢ Develop as a resource for EOD commands and families

➢ Identify synergy partners

# Moving Forward

**Professionalism:**

➢ Conferences and Workshops

➢ Influence Committee



➢ Advisory Committee for the Foundation

➢ Professional Association Involvement

# Moving Forward

**Help Wanted:**

➤ Involvement:
- Committee participation/leadership
- Board of Director Interest
- Communication of ideas
- Identify awareness opportunities

➤ Funding Support (Non-Gov)
- Direct donations & sponsorships
- CFC awareness
- Fund-raisers
- Endowment support

# We appreciate your support and service

**But the bravest are surely those who have the clearest vision of what is before them, glory and danger alike, and yet notwithstanding, go out to meet it. --**Thucydides

# Combating Terrorism Technical Support Office

**Vision:**

Identify requirements to combat terrorism and provide solutions to warfighters, first responders, and other front-line users as rapidly as possible.

**Mission:**

Identify and prioritize the needs of the interagency community charged with combating terrorism. Deliver capabilities to those on the front lines through rapid research, development, test, evaluation, and operational support. Incorporate available expertise and experience from government, commercial, private, and academic sources throughout the United States and the world.

**Objectives:**

- Provide interagency forum to coordinate R&D requirements for combating terrorism
- Sponsor interagency advanced technology development
- Promulgate technology & information transfer
- Influence policy development
- Guide basic and applied research

# CTTSO Organization

# TSWG Organization

INTERNATIONAL
PROGRAMS

# TSWG Mission

- **Mission:** Conduct the U.S. national interagency research and development program for Combating Terrorism through rapid research, development, and prototyping.

- **Objectives:**
  - Provide interagency forum to coordinate R&D requirements for combating terrorism
  - Sponsor R&D not addressed by individual agencies
  - Promote information transfer

# Interagency Partnership

## Department of Defense
OASD(SO/LIC)
OATSD(NCB)CP/CBD
OUSD(A&T) DDR&E and S&TS/LW
Armed Forces Institute of Pathology
Defense Advanced Research Projects Agency
Defense Computer Forensics Laboratory
Defense Intelligence Agency
Defense Threat Reduction Agency
Joint IED Defeat Task Force
National Security Agency
Pentagon Force Protection Agency
Polygraph Institute
The Joint Staff
Unified Commands
US Special Operations Command
US Air Force
    Air Combat Command
    Air Force Research Lab
    Electronic Systems Center
    AFOSI
US Army
    52nd ORD
    SBCCOM / ECBC
    Corps of Engineers / ERDC / PMDC
    Criminal Investigations Command
    Natick RDE Center
    20th Support Command (CBRNE)
    Training and Doctrine Command
    National Guard Bureau
US Navy
    Naval Criminal Investigative Service
    Naval Facilities Engineering Service Center
    Naval Special Warfare
    NEODTD / DTRG

US Marine Corps
    Chemical Biological Incident Response Force
    Network Operations & Security Command

## Department of State
Bureau of Diplomatic Security
Office of the Coordinator for Counterterrorism
Overseas Building Operations

## Department of Agriculture
Agricultural Research Service
Animal and Plant Health Inspection Service
Food Safety and Inspection Service
Office of the Inspector General

## Department of Energy
National Nuclear Security Administration
Office of Energy Assurance
Office of Security

## Department of Health and Human Services/USPHS
Centers for Disease Control & Prevention
Food & Drug Administration
National Institute for Occupational Safety and Health

## Department of Homeland Security
Border and Transportation Security
Immigration and Customs Enforcement
Office for Domestic Preparedness
Emergency Preparedness & Response
Transportation Security Agency
Science and Technology
US Coast Guard
US Secret Service

## Department of Commerce
National Institute of Standards and Technology
    Office of Law Enforcement Standards

## Department of Justice
Bureau of Alcohol, Tobacco, Firearms and Explosives
Drug Enforcement Administration
    Federal Bureau of Investigation
Federal Bureau of Prisons
National Institute of Justice
    Office of Justice Programs
US Marshals Service

## Department of Transportation
Federal Aviation Administration
Federal Railroad Administration
Federal Transit Administration
National Highway Traffic Safety Administration
Volpe National Transportation Systems Center

## Department of the Treasury
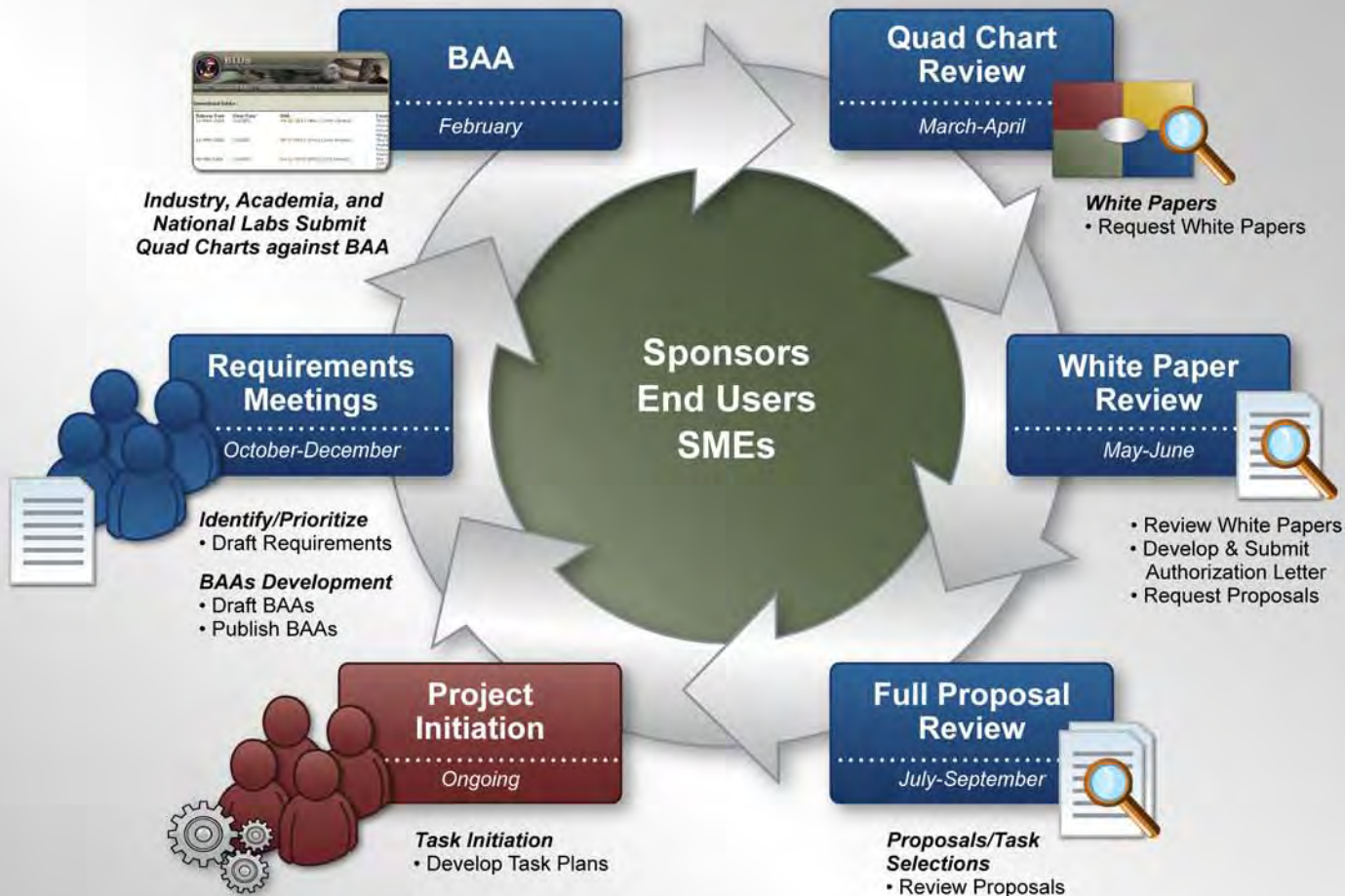Federal Reserve Board

## Independent Agencies
Environmental Protection Agency
General Services Administration
Intelligence Community
Interagency Board
National Virtual Translation Center
Nuclear Regulatory Commission
State and Local Agencies
Supreme Court of the United States
US Capital Police
US Postal Inspection Service
US Senate Sergeant at Arms
US Supreme Court Police

# Business Cycle

# B.I.D.S. – www.bids.tswg.gov

# CTTSO Performers



**TSWG Projects**

Australia   Canada   France   Germany   Israel   New Zealand   Singapore   Switzerland   United Kingdom

# Technology Readiness Levels



Technology, System Test, Qualification and Operation

Technology System/Subsystem Development

**TSWG**

Technology Demonstration

Technology Development

Research to prove Feasibility

Basic Technology Research

TRL 9
TRL 8
TRL 7
TRL 6
TRL 5
TRL 4
TRL 3
TRL 2
TRL 1

**TRL9:** Actual Technology system qualified through successful mission operations.

**TRL8:** Actual Technology system completed and qualified through test and demonstration.

**TRL7:** Technology systems prototype demonstration in an operational environment.

**TRL6:** Technology system/subsystem model or prototype demonstration in a relevant environment.

**TRL5:** Technology component and/or basic technology subsystem validation in a relevant environment.

**TRL4:** Technology component and/or basic technology subsystem validation in a laboratory environment.

**TRL3:** Analytical and experimental critical function and/or characteristic proof-of-concept.

**TRL2:** Technology concept and/or application formulated.

**TRL1:** Basic principles observed and reported.

# Technology Transition

- Objective: Affordable, operationally suitable technology in the hands of our users
- An integral part of TSWG process
  - Begins with the proposal
  - Continues throughout development
  - Requires periodic deliverables
- Prepares for the unexpected
- Planning assistance provided by TSWG/CTTSO
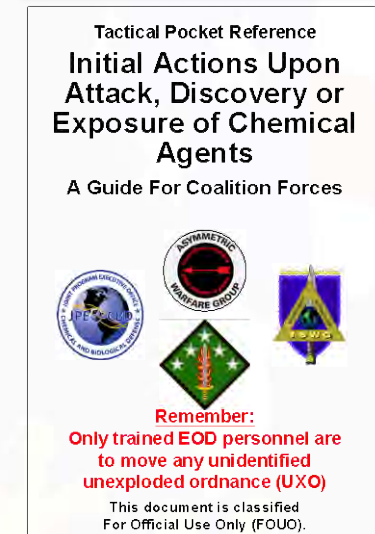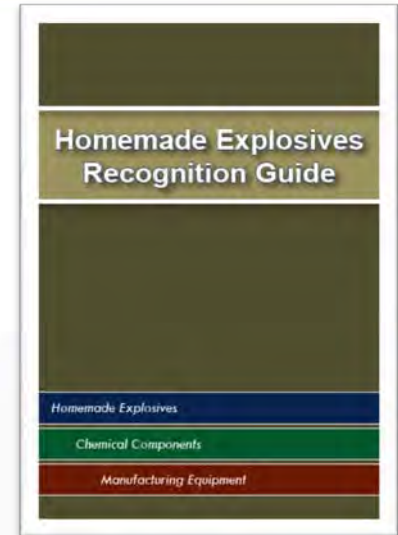- Accelerates prototype to product cycle

# TSWG Project Highlights
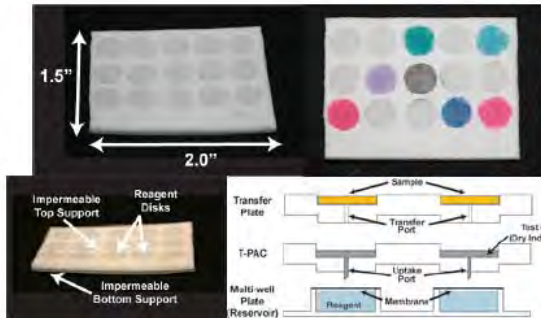


**HME Precursor Detection Kit**



**Hardened Trace Explosives Detector**



**Car Scan –**

**Dual Energy Low Dose X-Ray**



**Single-Sided X-Ray**



**Graphical Training Aids**

# TSWG Project Highlights



**Forward Fighting Positions**



**Digital Observation Guard**



**Urban Canyon**



**Personal Hydration System Water Filter**



**Tactical Glove**



**FIVAK**

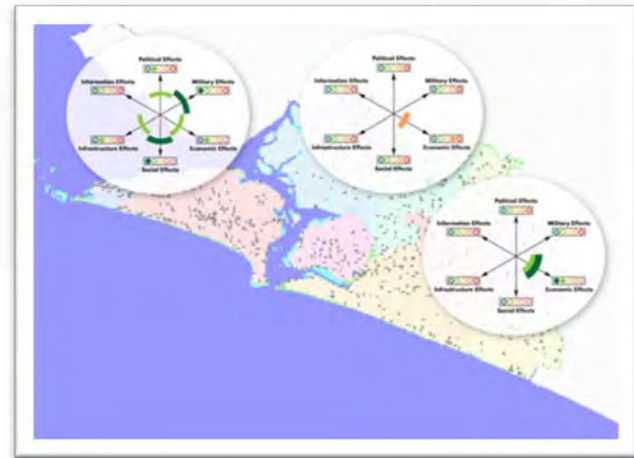# TSWG Project Highlights



**X800/X400 Through-Wall Imaging**



**Improved Laser/Light Aiming Device**



**Vapor Wake Canines**



**HSCB – S-CAT Decision aid**

# CTTSO Conferences/Workshops



Explosives Detection 2009 Symposium and Workshop
October 20-23 | San Diego, CA



Personal Protective Equipment Conference
New Technologies - Standards - Training for Emergency Response | Fort Lauderdale, FL | November 16 - 20 2009

# Homeland Security Presidential Directive -19 (HSPD-19)

HSPD-19 establishes a national policy and calls for the development of a strategy to prevent, detect, and respond to terrorist's use of explosives in the United States. The HSPD-19 Implementation Plan mandates the creation of an interagency working group for counter-IED technologies in the science and technology field.

CTTSO co-chairs the Domestic Counter-Improvised Explosives Devices (IED) Working Group under the White House National Science and Technology Council Committee on Homeland and National Security.

The working group is conducting a government-wide inventory of R&D efforts to identify responder requirements from CONUS based counter-IED agencies.

The working group will then analyze needs against capabilities and produce a gap analysis for interagency coordination of research, development, test and evaluation to address the technology gaps.

# Homeland Security Presidential Directive -22 (HSPD-22)

The HSPD-22 establishes a national policy to strengthen the United States' ability to prevent, respond to, and recover from toxic chemical terrorist attacks and chemical incidents. CTTSO/TSWG coordinated with agency heads to deliver a National Research and Development Plan for Personal Protective Equipment (PPE).

HSPD-22 launches a strategy for focused R&D in chemical PPE to address the utility and availability of PPE for chemical incident response.

The plan recommends objectives to establish a coordinated partnership with standards-setting organizations, industry representatives, and professional organizations that improves the level of **protection**, **utility**, and **availability** of high quality chemical PPE.
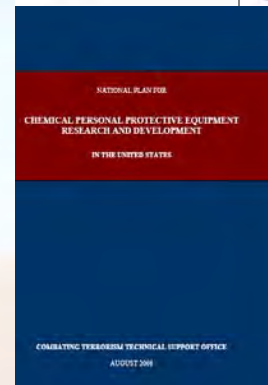


The White House approved the plan in January 2009. The implementation plan is under development with the White House Homeland Security Council and has the potential to garner additional focused research and funding in the chemical PPE arena.

# Summary

- Forum to Identify, Prioritize, Resolve, and Fund Operational Needs/Requirements

- Driven by Interagency User Elements

- Acquisition / Dual Use / Commercialization

- Fast Track and Flexible Program Forum

# Contact Information

Gabe Ramos
Deputy Director Technical Programs
Combating Terrorism Technical Support Office
ramosg@tswg.gov

# Explosive Ordnance Disposal (EOD) Force Update

## 29 APRIL 2010
## CDR Gene Rathgeber
### Chief Staff Officer EOD GROUP ONE

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# Overview

- *Core Mission Areas*

- *Who We Are*

- *Operational Force Lay Down*

- *Units of Action*

- *Enlisted Accession / Retention*

- *Key EOD Force Initiatives*

- *Statistics and Highlights*

- *Where Industry can Help*

- *Questions*

*Explosive Ordnance Disposal*

# Core Mission Areas





- **Explosive Ordnance Disposal**
  - Conventional, Chem, Bio, Nuke, U/W, IED, WMD
  - Remove hazards / Enable Access on land and from sea
- **Naval Expeditionary Combat Ops**
  - WMD, IED, UXO, Mines
  - NECC / NAVEXPEDRIVFOR
  - Marine Mammal Systems / Unmanned Systems
  - U.S. Secret Service and DOS VIP protection
- **Underwater Mine Countermeasures**
  - Organic, Dedicated UMCM
  - Naval Special Clearance Team
  - Marine Mammal Systems/Unmanned Systems
- **Expeditionary Diving / Salvage**
  - MDSU ONE/TWO…..rapid deployment

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# *Who We Work With*





- Conventional Forces
  - Blue: CSG, ESG, MCMRONs, USCG
  - Green: USMC
- SOF
  - Army Special Forces
  - Navyy Seals
- Other
  - DTRA
  - USSS
  - Inter-Agency (HMA, JTF-FA)
- Theater Engagement
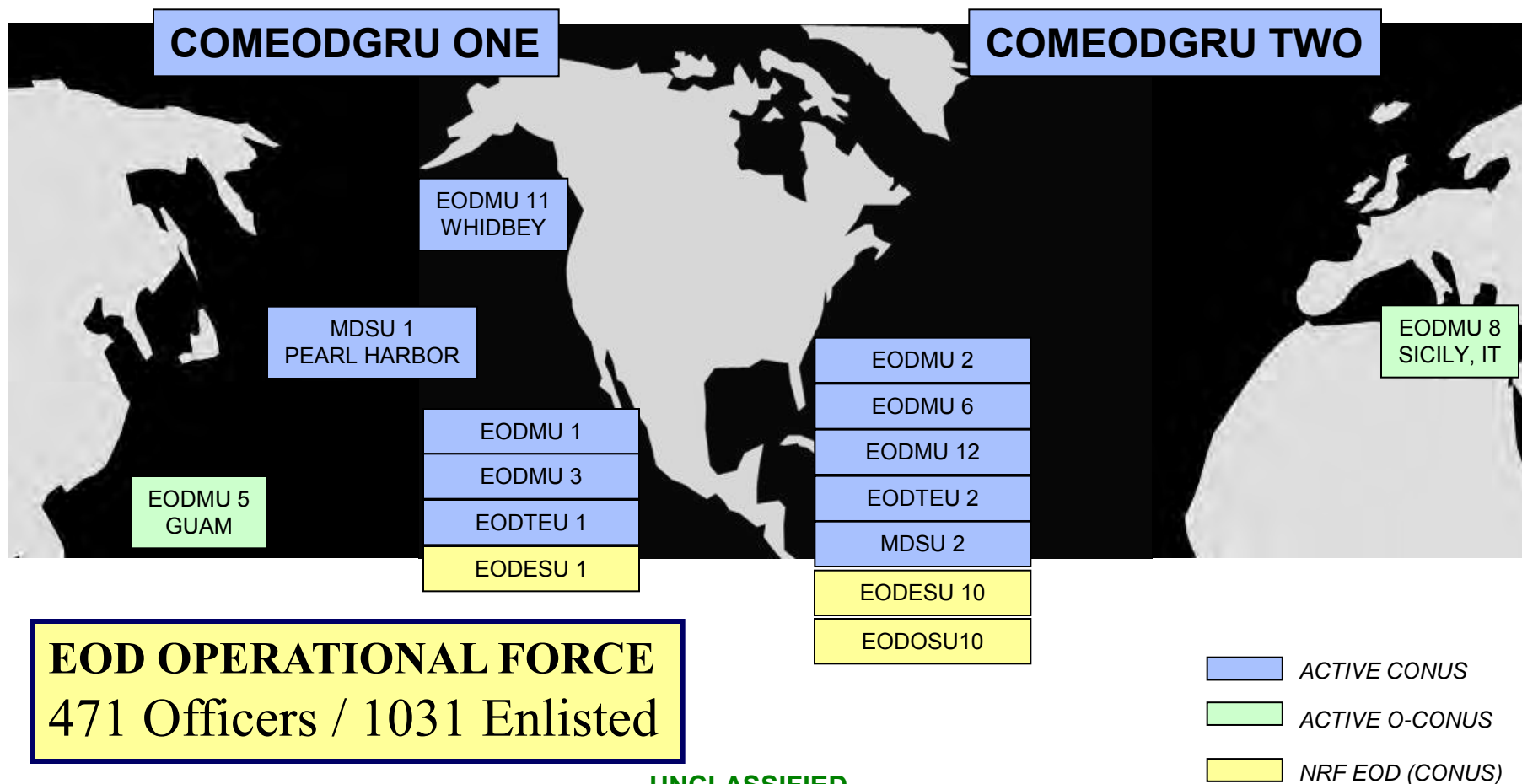  - Significant multi-national engagement

# Operational Forces

Low Supply / High Demand

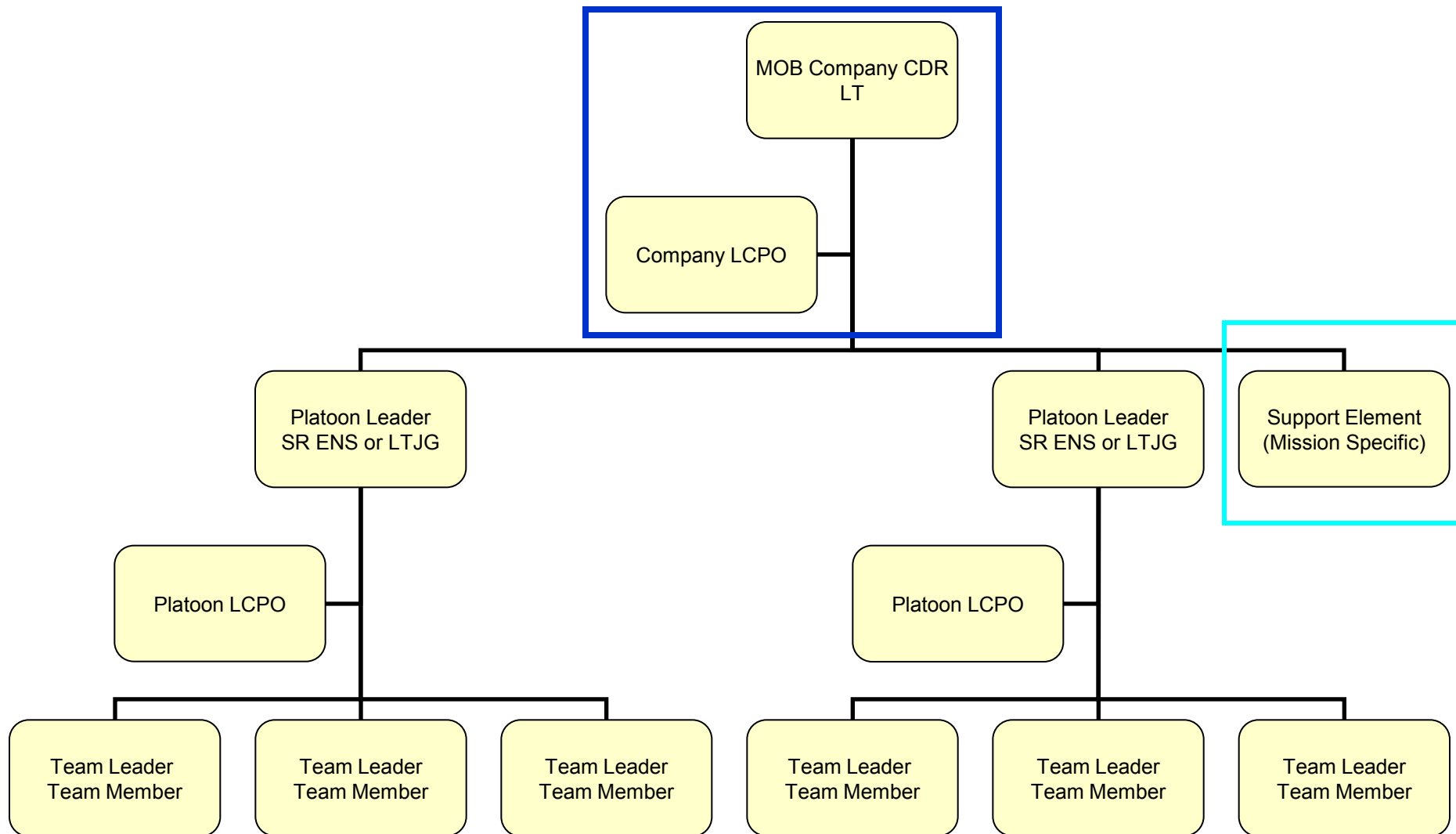**COMEODGRU ONE**

**COMEODGRU TWO**

EODMU 11 WHIDBEY

MDSU 1 PEARL HARBOR

EODMU 5 GUAM

EODMU 1
EODMU 3
EODTEU 1
EODESU 1

EODMU 2
EODMU 6
EODMU 12
EODTEU 2
MDSU 2
EODESU 10
EODOSU10

EODMU 8 SICILY, IT

**EOD OPERATIONAL FORCE**
471 Officers / 1031 Enlisted

*ACTIVE CONUS*

*ACTIVE O-CONUS*

*NRF EOD (CONUS)*

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*Explosive Ordnance Disposal*

5

# Tactical Unit Of Action
## MOBILE Company/Platoon Structure

SOF Company CDR
LT 2nd Tour

SOF Platoon Leader
LDO/CWO 1st Tour

Team Leader
Team Member

Team Leader
Team Member

Team Leader
Team Member

Team Leader
Team Member
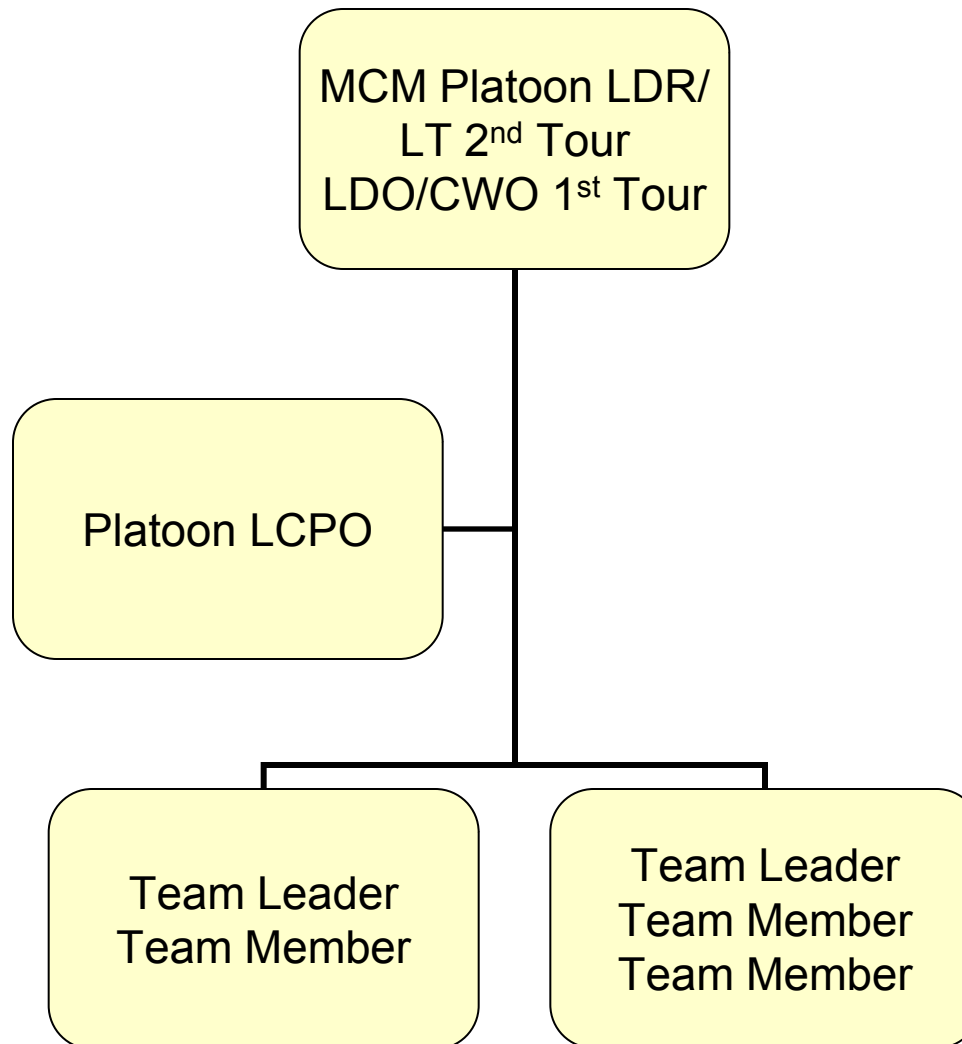
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# Enlisted Accessions and Retention

- ## *Accessions Requirement*

    - *FY10 Total Accession goal is 383 to meet 135 graduates*

    - *From Accession to Fleet is a Minimum of 85 weeks*

    - *Projected manning in FY 12 85% of requirement*

- ## *Retention*

    - *Force Shaping tools*

        - *Selective Re-enlistment Bonus (SRB)*

        - *Critical Skills Retention Bonus (CSRB)*

        - *Special Duty Assignment Pay (SDAP)*

# Key EOD Force Initiatives

- **<u>Improving Health of the Force</u>**

  - Implement (4:1 FRTP)

    - At best, current FRTP is 3:1 with mitigations in place

    - Potentially growing 8 additional EOD Platoons

      - *Will increase 5337 qualification rate*

- **<u>Implemented 12 week Training for PLTS</u>**

  - Advanced focused training increases readiness

# Statistics and Highlights

- ## Over 3500 Combat Missions in 2009

  - Over 400 Combat Awards

  - 2 Silver Stars

  - 42 Purple Hearts

- ## Navy EOD supporting the Surge in OEF

  - EOD GROUP (Task Force Troy)

  - Platoons

  - Battalion

- ## High Demand Low Density Asset

  - One of the highest OPTEMPO's in U.S. Navy

# Where We Need Your Help?



## Unmanned Systems

– *UUV/UAV/Ground Robotics communications enhancement*

– *Underwater vehicle sensor and neutralization technology*

– *Energy Efficiency*

– *Ground Robotics advancements*

  • *Reduce time-on-target*

  • *Light  weight systems for agile, dismounted ops without capability loss*

  • *Enhance manipulation capability*

  • *Extend operation life with advancements in power generation/supply*

## Personnel Protection

– *Ultra light and agile body armor*

– *Next generation bomb suit technology*



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# Where We Need Your Help?  Continued



## Standoff Detection and Disruption

– *Determine the threat before going into harms way*

– *Enhance survivability*

– *Defeat the Network**

– *Spectrum of Effects: Non-kinetic, low-order,*
   *high-order neutralization*

## Forensics

– *Radiographic systems*

– *Post Blast investigation*

– *Wireless transmission/reception**



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*Explosive Ordnance Disposal*

Today's Knights may wear a different suit of armor…but they have the same Honor, Courage and Commitment

CDR Gene Rathgeber
(619) 522-7501
eugene.rathgeber@navy.mil

U.S. Navy Explosive Ordnance Disposal

# *Headquarters U.S. Air Force*

## *Integrity - Service - Excellence*

# USAF EOD
# State of the Service Brief

**Year of the Air Force Family**

**Lt Col Richter**
**A7CXR**

**Year of the Air Force Family**

- **USAF EOD Program**
    - **"Who We Are"**
    - **"Where We Are"**
    - **"What  We've Done"**
- **Challenges**
- **Successes**
- **Remembering**
- **Questions**

**Year of the Air Force Family**

- **Governing policy directive for AF EOD program**

- **Organized as EOD flights under the Civil Engineer Squadron**
  - **Follows the typical AF Wing, Group, Squadron and Flight structure**

- **Nine primary mission areas:**
  - **Aerospace Platform response (combat, cargo, and Space Launch Vehicles)**
  - **Force Protection**
  - **WMD response**
  - **Nuclear**
  - **UXO response**
  - **Range Clearance**
  - **Port Mortuary**
  - **Support to Civil Authorities/VIPPSA**
  - **Training**

# *Explosive Ordnance Disposal*
# *Who We Are*



- **One of the most stressed career fields**
- **Maintain ~ 230 specialized equip UTCs**
- **Deployed and sustain ~ 100 theater UTCs**
- **Primary missions**
  - **Support combat aircraft sortie generation, nuclear stockpile, aerial ports and force protection**
- **Secondary missions**
  - **Provide EOD tactical and operational expertise to joint force/SOF and partnering nations**
- **Improvised Explosive Device growth as weapon of choice for insurgents has increased demand for EOD**
- **Irregular Warfare and Counter-Insurgency conflicts have highlighted shortage of CIED enablers**
- **Joint Force Doctrine changing to reflect expanding EOD/CIED requirements**

# *Explosive Ordnance Disposal Where We Are*

- **74 CONUS/OCONUS bases (total force)**
  - **Five flights supporting EUCOM Commander priorities**
  - **Eight flights supporting PACOM Commander priorities**

- **CENTCOM: ~ 33 locations in Afghanistan/Iraq, 5 locations outside**
  - **~ 130 deployed in Afghanistan**
    - **Largest presence in RC-S with almost 75% of EOD force**
    - **Over 50% of EOD force in theater the last two years**
  - **~ 110 deployed in Iraq**
    - **Significant reduction expected by end of year**
  - **~ 30 at Air Expeditionary Wings (AEW) and Groups (AEG) outside combat theater**

Year of the Air Force Family

- **Missions Consists of:**
  - **Improvised Explosive Device**
  - **Route Clearance**
  - **Cache**
  - **Post Blast**
  - **Unexploded Ordnance (UXO)**
  - **Enemy Attack**
  - **Explosive Remnants of War**



**EOD Operations**

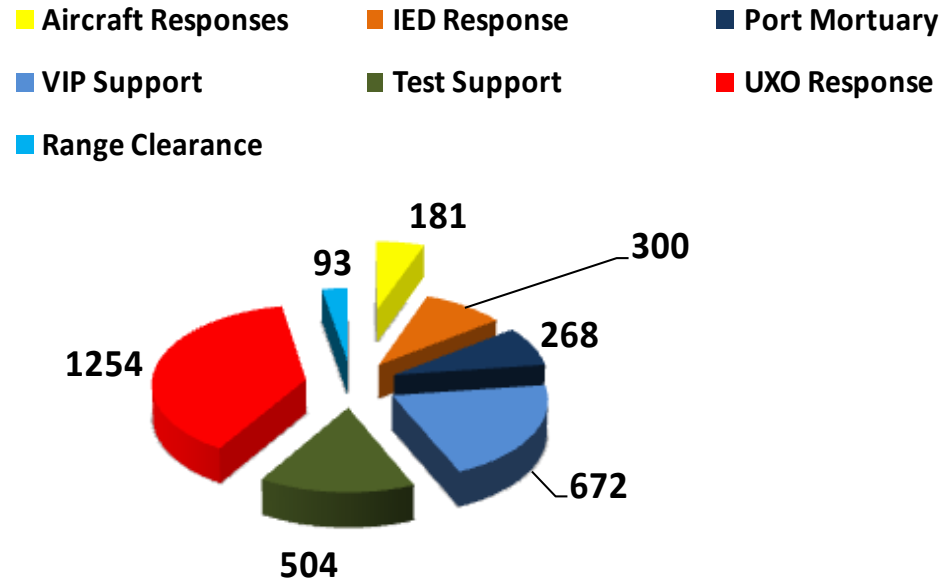■ **Other Svs**    ■ **USAF**

5820

6307
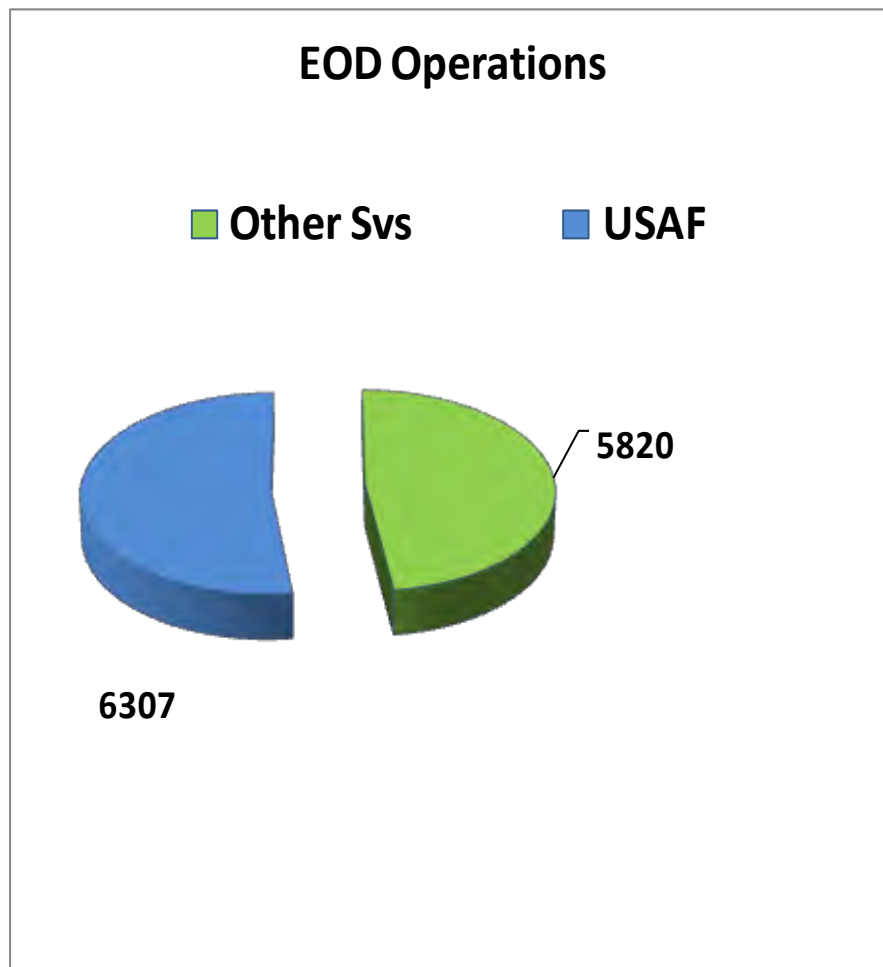
*Information derived from various sources*

**Nine Mission Areas**

- **Aircraft response**
- **Force Protection**
- **WMD response**
- **Nuclear**
- **UXO response**
- **Range Clearance**
- **Port Mortuary**
- **Support to Civil Authorities/VIPPSA**
- **Training**

**EOD Missions**

- Aircraft Responses
- IED Response
- Port Mortuary
- VIP Support
- Test Support
- UXO Response
- Range Clearance

181
300
268
672
504
1254
93

*Information derived from USAF EOD Information Management System*

*Integrity - Service - Excellence*

# *USAF EOD Challenges*

- **NAVSCOLEOD Attrition**
  - **Emotion Quotient Inventory (EQ-i)**
  - **Moving Prelim course from Lackland AFB to Sheppard AFB**
  - **Physical Assessment Skills Test**
  - **2AF considering placement of EOD accessions in newly developed Battlefield Airman BMTS**

- **Retention**
  - **Increased Promotions--chronic critical skills plus-ups**
  - **Increased Selective Reenlistment Bonuses (SRB)**
  - **Special Duty Assignment Incentive Pay (SDAP)**
  - **1299 auth - 970 assigned (75%)… {56 women assigned ~4%}**

- **Nuclear Support and Global Strike Command**

- **Balancing Home Station Support with Deployed JFC Support**

# *USAF EOD Successes*

- **Combat Battlefield Ready Airman Course**

- **Contract Technical Support**

- **MRAP and M-ATV Fielding**
    - **105 MRAP CAT I and II fielded since Jan 08 (AF EOD Variant)**
    - **48 M-ATV being fielded with CROWS II**

- **Joint Robotics Repair Facility**

- **Transformation**
    - **Incorporating in CE Doctrine**
    - **EOD Vision 2020**

TSgt Walter M. Moss Jr.
29 March 2006
Baghdad, Iraq

MSgt Brad A. Clemmons
21 August 2006
Taji, Iraq

SrA William N. Newman
7 June 2007
Balad, Iraq

TSgt Anthony L. Capra
9 April 2008
Balad, Iraq

Capt Kermit O. Evans
3 December 2006
Baghdad, Iraq

TSgt Timothy R. Weiner
7 January 2007
Baghdad, Iraq

TSgt Phillip A. Myers
4 April 2009
Bastion, Afghanistan
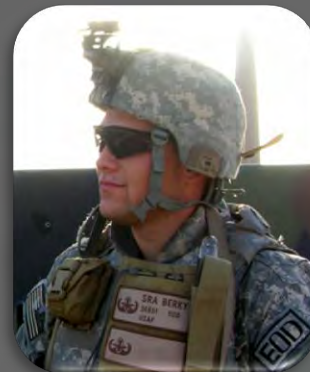
SSgt Bryan D. Berky
12 September 2009
Farah, Afghanistan

SrA Daniel B. Miller Jr.
7 January 2007
Baghdad, Iraq

SrA Elizabeth A. Loncki
7 January 2007
Baghdad, Iraq

TSgt Anthony C. Campbell
15 December 2009
Helmand, Afghanistan

TSgt Adam K. Ginett
19 January 2010
Kuhak, Afghanistan

# Questions

# United States Marine Corps Explosive Ordnance Disposal

LtCol Marc Tarter

# EOD Mission

To support Marine operating forces, national security strategy, and force protection by locating, accessing, identifying, rendering safe, neutralizing, and disposing of hazards from foreign and domestic, conventional, chemical, biological, radiological, nuclear, and high yield explosives (**CBRNE**), unexploded explosive ordnance (**UXO**), improvised explosive devices (**IEDs**), and weapons of mass destruction (**WMD**) that present a threat to operations, installations, personnel, or materiel. (MCRP 3-17.2C)

Note: *USMC EOD units are authorized to conduct field disassembly and inerting operations for the purpose of exploitation and intelligence gathering.*
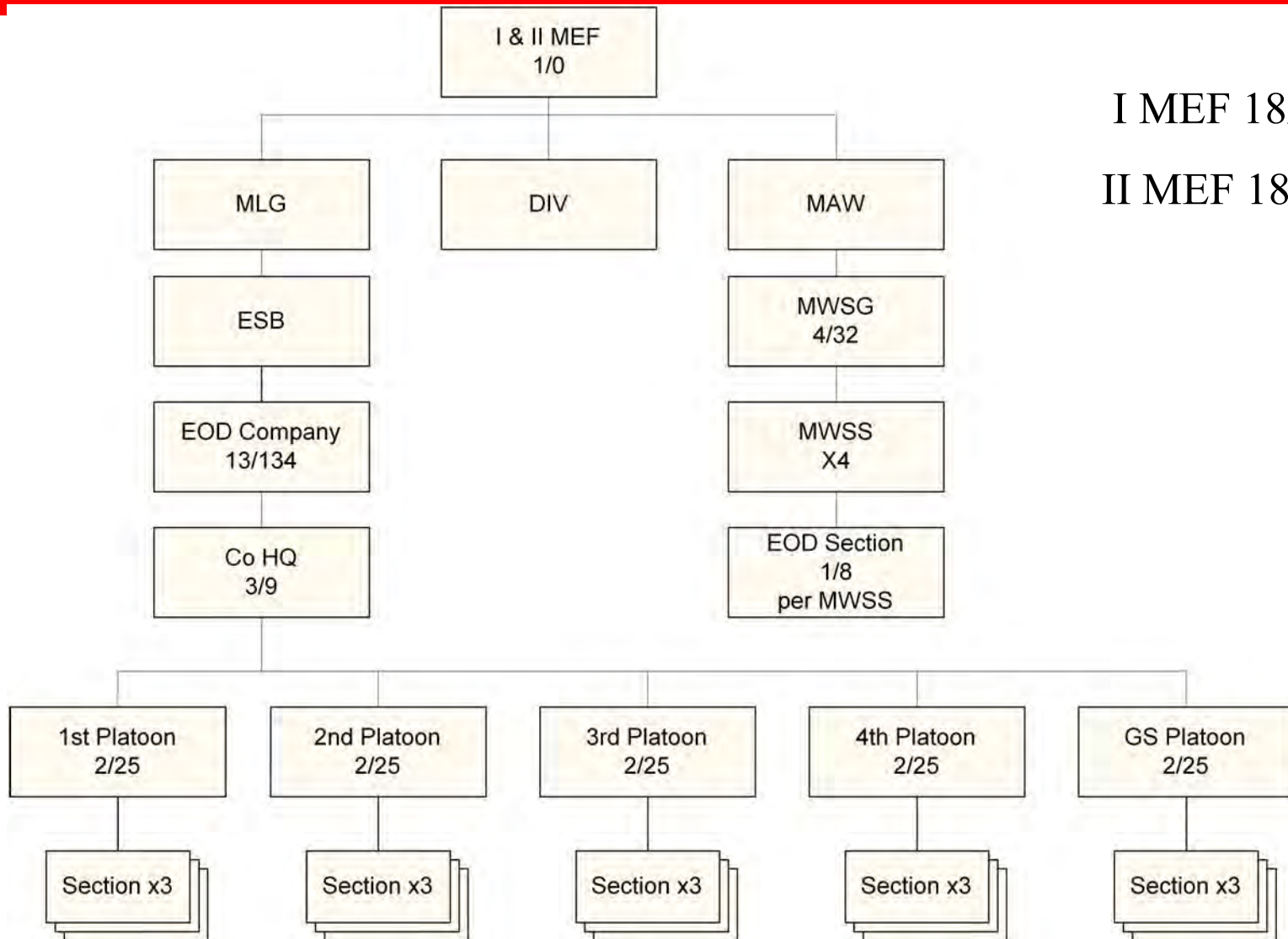
2

# MAGTF 101

- Marine Corps deploys expeditionary forces that fight on a combined arms concept. These forces are called Marine Air Ground Task Forces (MAGTF'S).

- MAGTF Composition
  - Command Element
  - Ground Combat Element
  - Air Combat Element
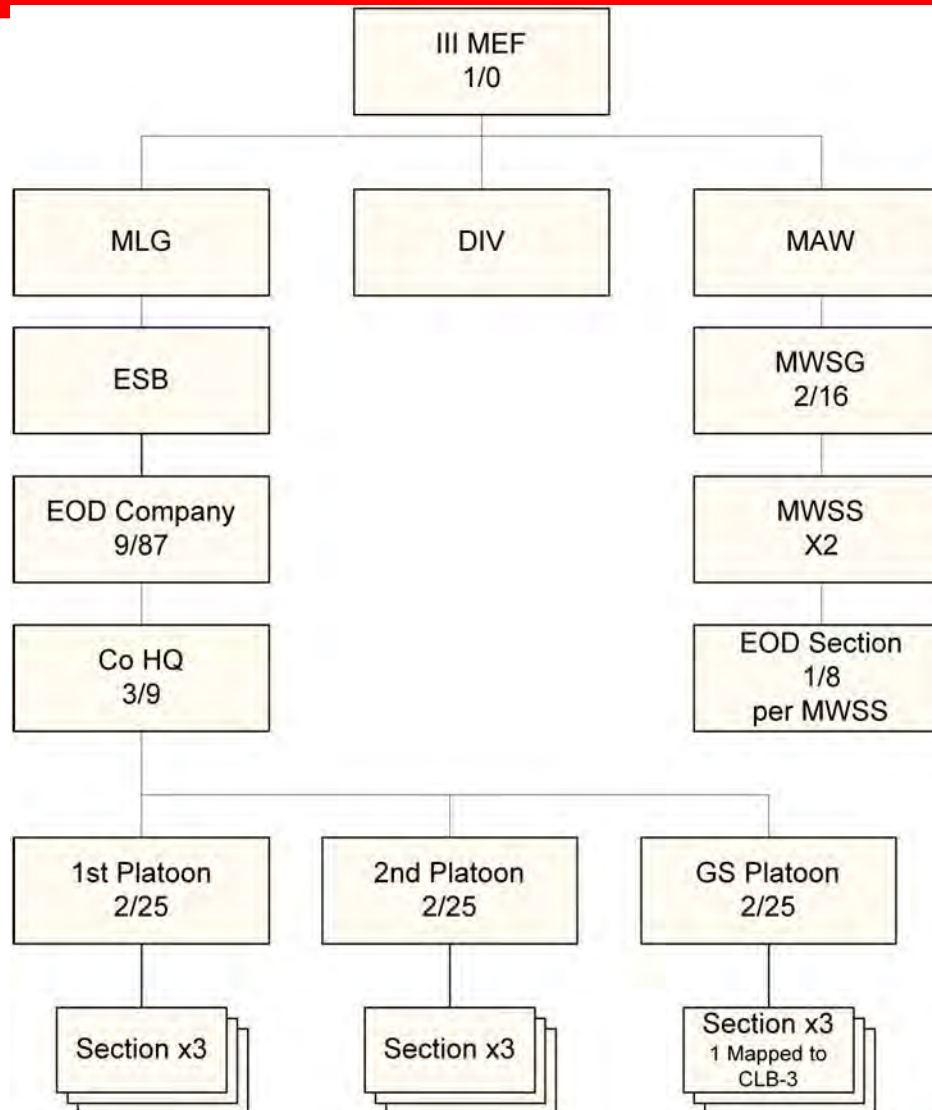  - Logistics Combat Element

# Current I & II MEF EOD T/O



I MEF 18/166

II MEF 18/166

4

# Current III MEF EOD T/O



III MEF 12/103

# EOD Company Standup

- ## EOD Company activated within in each MLG - 1 Oct 2009.

CAMP LEATHERNECK, Afghanistan-Capt. Timothy M. Callahan, Commanding Officer of EOD Company unfurls the company guidon.

# Company Concept of Employment

- EOD Company Concept of employment:
  - Organized to provide command and control for EOD operations in support of the MAGTF.

- Structure
  - EOD Company:
    - Each Platoon manned and equipped IOT support a Regiment not conducting Distributed Operations (DO).
    - Two Platoons (or more) are required for a Regiment conducting DO.

  - EOD Platoon:
    - Three sections per Platoon
    - Each section manned and equipped IOT support a Battalion non-DO.
    - Two sections (or more) are required for a Battalion conducting DO.

- Based on mission requirements, EOD section can be reinforced or divided into task-organized response elements

# EOD Base / Station Missions

- Base/Station EOD teams are tasked with the full spectrum of Force Protection / Anti-Terrorism / Homeland Defense missions
  - 24 hr Emergency IED/WMD/UXO/Crash response.
    - On & off Base
    - 1st Responder Agreements w/ local municipalities
  - Routine base support

# Other EOD Missions

- Department of Homeland Defense
  - FBI
  - ATF
  - TSA
  - USSS
- State and Local agencies
- Technical Support
  - Other Agencies

# MARSOC EOD

- EOD is organic to MARSOC
- Supports all missions;
  - Direct Action (DA)
  - Special Reconnaissance (SR)
  - Foreign Internal Defense (FID)
  - Counterterrorism (CT)
  - Unconventional Warfare (UW)
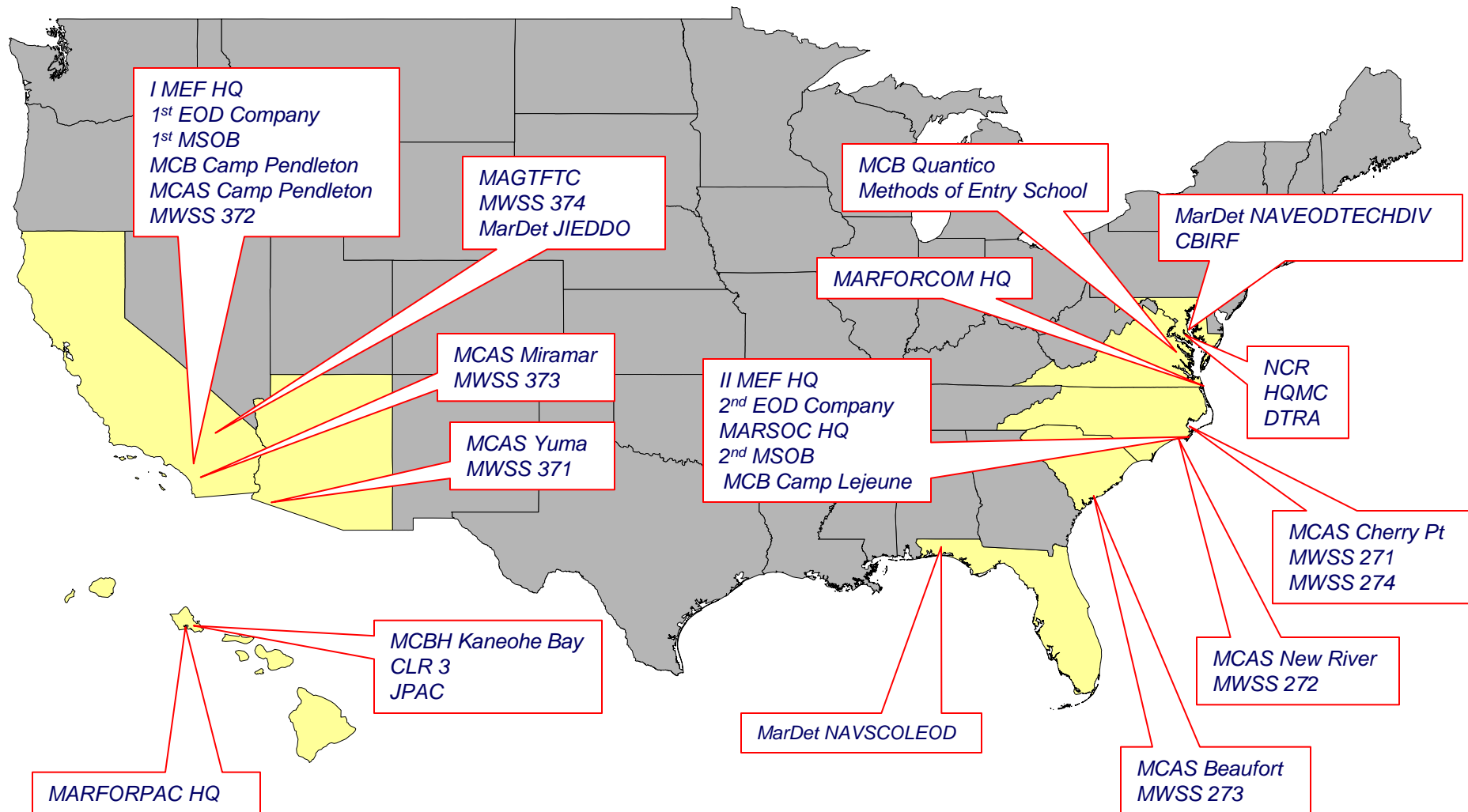- Two -Four EOD personnel deployed per MSOC, plus CJSOTF requirements

# Current EOD Support Operations

- Afghanistan  (Over 100 EOD personnel per rotation)

- Iraq  (Task Force Troy - CEXC)

- Seven standing MEUs (1/8 EOD personnel per MEU)

- Continuous VIPPSA missions (POTUS, DOS, etc.)

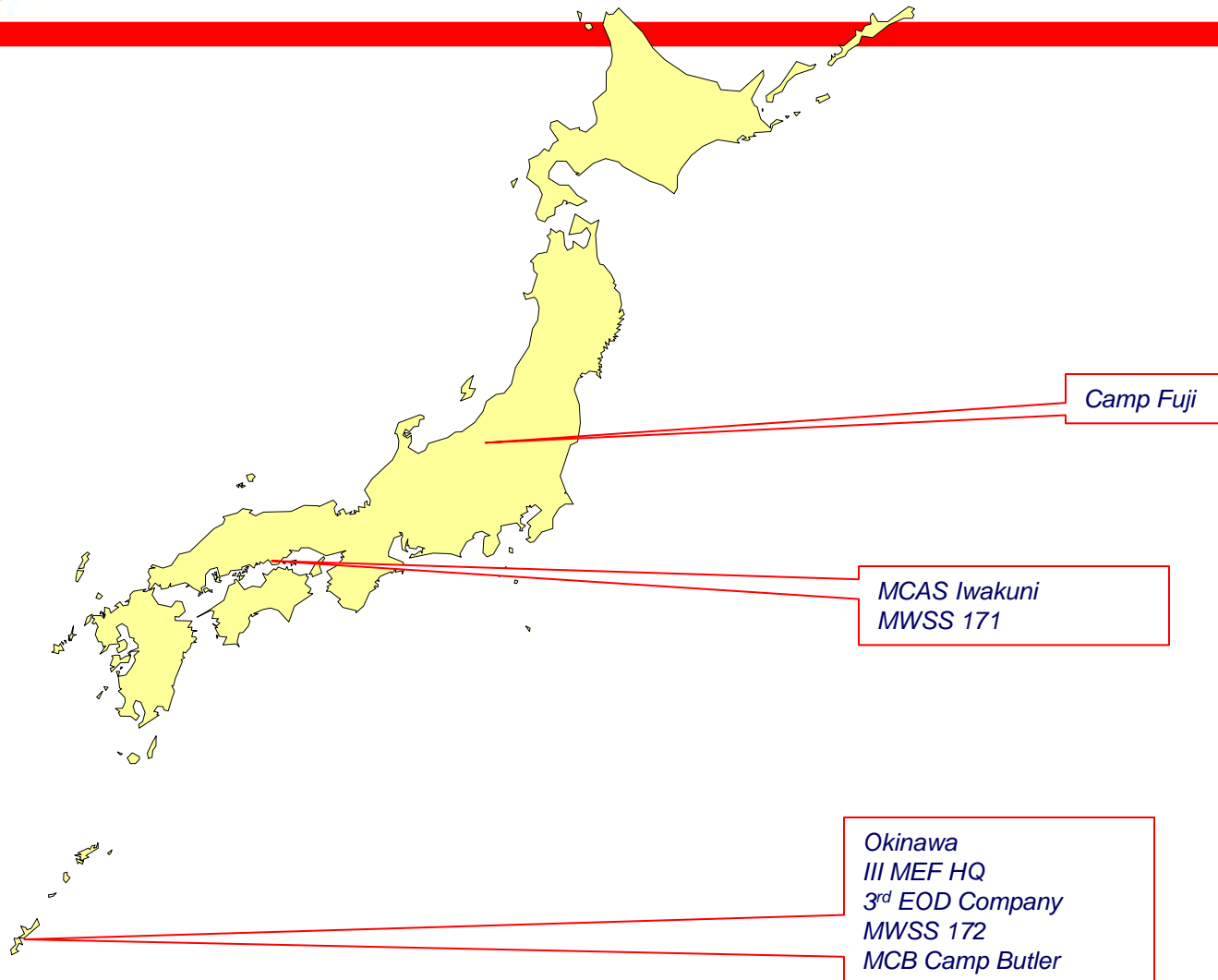- Joint POW/MIA Accounting Command (JPAC)

# Locations



I MEF HQ
1st EOD Company
1st MSOB
MCB Camp Pendleton
MCAS Camp Pendleton
MWSS 372

MAGTFTC
MWSS 374
MarDet JIEDDO

MCB Quantico
Methods of Entry School

MarDet NAVEODTECHDIV
CBIRF

MARFORCOM HQ

NCR
HQMC
DTRA

MCAS Miramar
MWSS 373

II MEF HQ
2nd EOD Company
MARSOC HQ
2nd MSOB
MCB Camp Lejeune

MCAS Yuma
MWSS 371

MCAS Cherry Pt
MWSS 271
MWSS 274

MCBH Kaneohe Bay
CLR 3
JPAC

MCAS New River
MWSS 272

MarDet NAVSCOLEOD

MARFORPAC HQ

MCAS Beaufort
MWSS 273

04/29/10

13

# Locations (Cont)



Camp Fuji

MCAS Iwakuni
MWSS 171

Okinawa
III MEF HQ
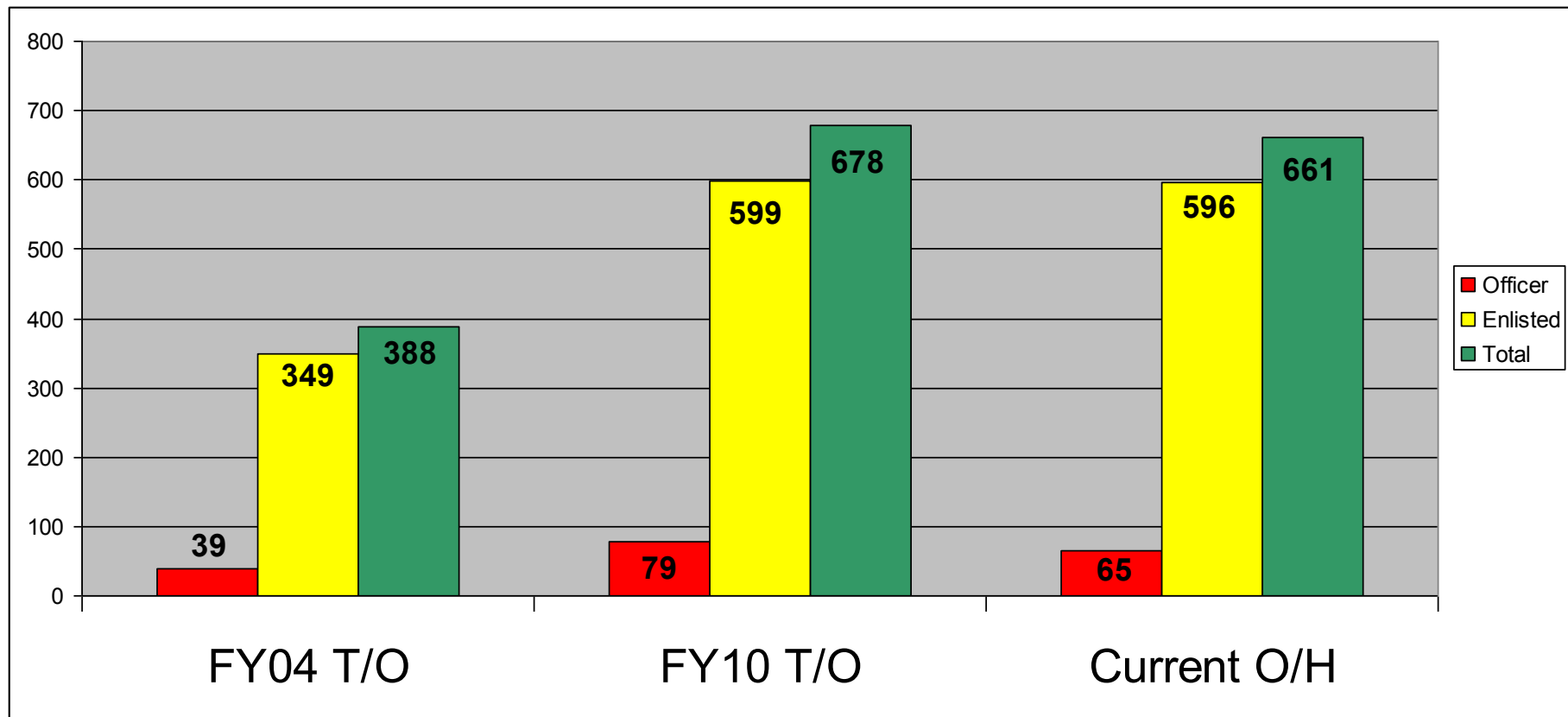3rd EOD Company
MWSS 172
MCB Camp Butler

# EOD Manpower Increases

- EOD strength increased several times since 2004 (FSRG 2004, MARSOC, and 202K Grow the Force)

# Requirements to become an EOD Technician



- Must be a Cpl or Sgt. (Not selected for SSgt)
- 21 Years of age.
- GT score of 110 or above.
- Physically Fit (1st Class PFT / CFT)
- Bomb Suit Agility Test
- Be eligible for a security clearance based on an SSBI.
- Be interviewed, screened and recommended by a Marine Corps EOD SNCO & Officer.
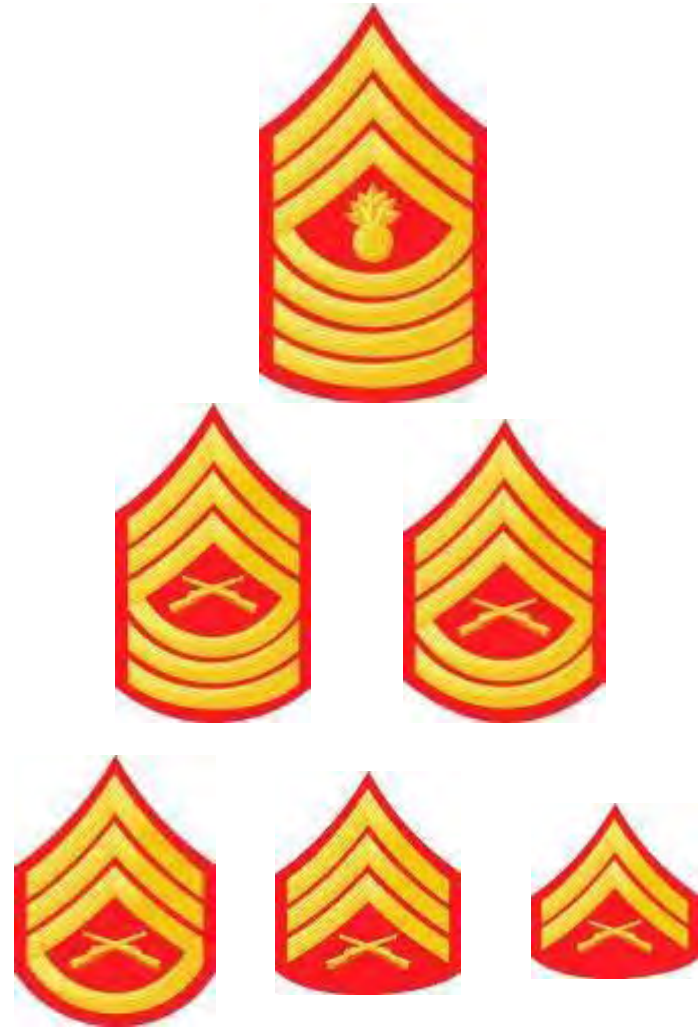- For complete list of requirements see MCO 3571.2_

# Who we have (Enlisted)

- Sgt – MGySgt.
- Cpl's promoted to Sgt w/ minimum TIG (Normally at School)

- LDO  Capt – LtCol
- WO – CWO5
- _All_ officers were enlisted EOD Technicians
- No Unrestricted Officers

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# Initiatives impacting EOD

- Company growth
- Pacific lay down
  - Guam
  - Okinawa
  - Hawaii
- MARFORSOC (EOD growth)
- Advanced USMC EOD Training Center

# Questions